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Canada

Selected Canadian environment, economic and social indicators

This table highlights a few environment, economic and social indicators. Setting them side-by-side starts to illuminate the relationships that exist among these three areas. More indicators can be found in the section "Canadian environment, economic and social indicators."

Table 1
Selected Canadian environment, economic and social indicators

	Period	Percentage change
		%
Population	2009 to 2010	1.2
Gross domestic product, monthly	June 2011	0.2
Greenhouse gas emissions	2008 to 2009	-5.7
Particulate matter ($PM_{2.5}$)	2000 to 2008	n.s.s. [1]
Ground-level ozone (median percentage change per year)	1990 to 2008	0.6
Natural resource wealth	2009 to 2010	23.4

1. Not statistically significant.

Source(s): Statistics Canada, CANSIM tables 051-0001 (accessed August 17, 2011) and 378-0005 (accessed September 20, 2011). Statistics Canada, 2011, *Gross Domestic Product by Industry*, Catalogue no. 15-001-X. Environment Canada, 2011, *National Inventory Report 1990-2009: Greenhouse Gas Sources and Sinks in Canada - Executive Summary,* Catalogue no. En81-4/1-2009E-PDF. Environment Canada, 2011, *Measuring Sustainability: Canadian Environmental Sustainability Indicators*, *www.ec.gc.ca/indicateurs-indicators/default.asp?lang=EnXXn=ED311E59-1&offset=6&toc=show* (accessed August 17, 2011).

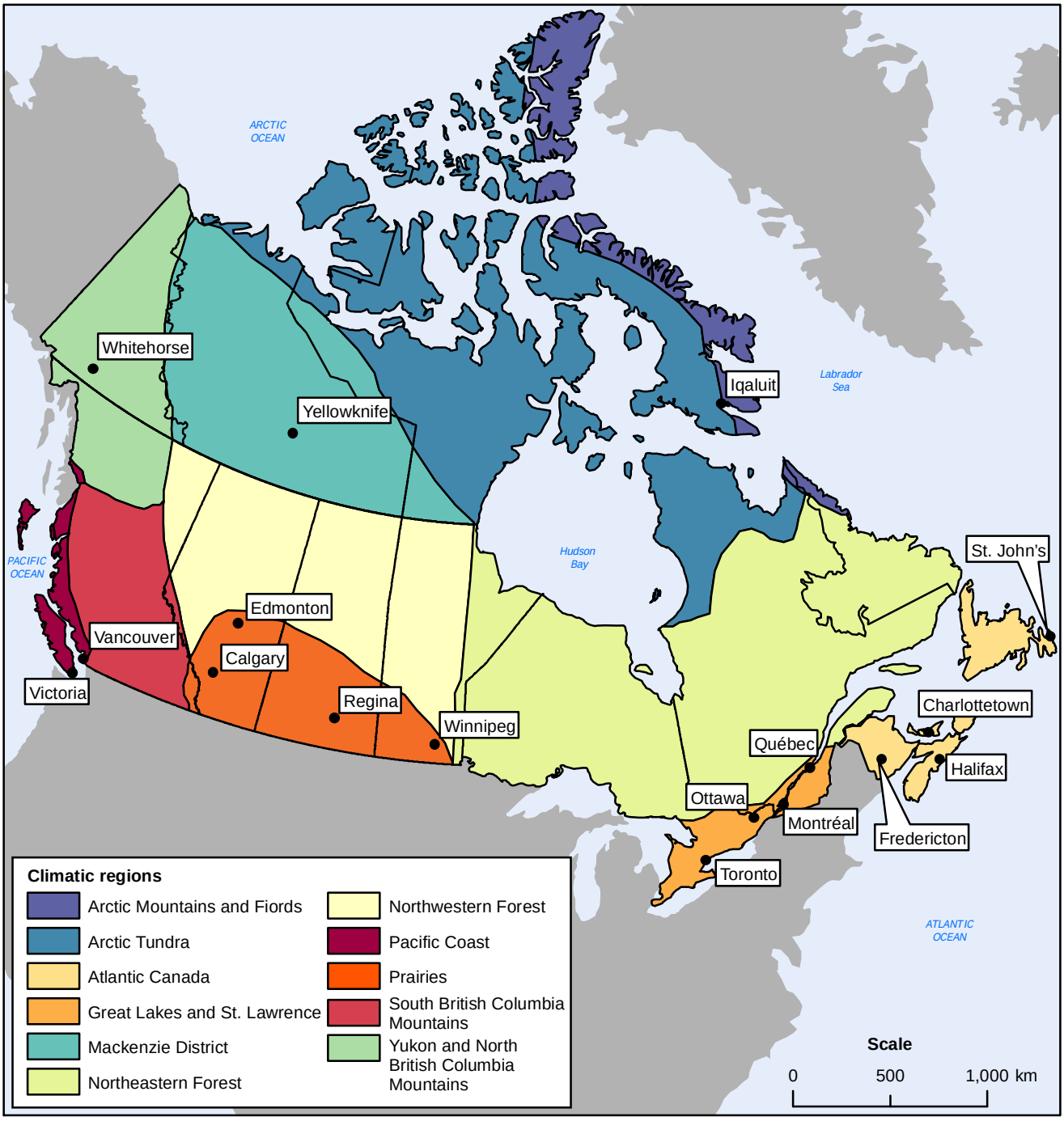
Precipitation trends in Canada

Jeff Fritzsche, Environment Accounts and Statistics Division

The data in this article consist of annual and seasonal time series of precipitation over a 62 year period (1948 to 2009) for eleven climatic regions as well as for Canada as a whole (Map 1). The time series are expressed in precipitation percentage departure from normal, which is the difference between the observed precipitation values and a precipitation 'normal' (the average of observed precipitation over a specified time period) divided by the normal and multiplied by 100. The period used to calculate the normal employed in this analysis is 1961 to 1990, as reported by Environment Canada in the *Climate Trends and Variations Bulletin* (CTVB) for Canada.[1] The departure from normal data used in this study were taken directly from the CTVB and consist of annual and seasonal precipitation percentage departures.

1. Environment Canada, 2011, *Climate Trends and Variations*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed June 15, 2011).

Map 1
Canada's climatic regions



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

A continuing data collaboration

This article is the third of an ongoing series in *EnviroStats* showcasing data related to Canada's climate and the impacts of climate change. The focus of these articles is short statistical analyses of climate-related data, such as sea ice extent and snow cover. The second in the series was released in March, 2011 (*www.statcan.gc.ca/pub/16-002-x/2011001/part-partie2-eng.htm*) and examined temperature trends across Canada.

The articles are the product of an ongoing collaboration among Statistics Canada, Environment Canada and Natural Resources Canada.

The data featured in the articles will be made available through the Statistics Canada website, both in free CANSIM data tables and through new articles re-examining trends in the data every few years.

Precipitation is considered by the World Meteorological Organization-Global Climate Observing System as an Essential Climate Variable,[2] part of a group of variables related to the atmosphere. Precipitation is also one of several variables used to support the work of the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC).[3]

2. Global Climate Observing System, 2011, *Global Climate Observing System*, *www.wmo.int/pages/prog/gcos/index.php?name=EssentialClimateVariable* (accessed June 1, 2011).
3. Global Observing Systems Information Center, n.d. (no date), *GCOS Essential Climate Variables (ECV) Data & Information Access Matrix*, *http://gosic.org/ios/MATRICES/ECV/ecv-matrix.htm* (accessed June 20, 2011).

Background and methodology

The precipitation percentage departures from normal data used in this study were taken directly from the *Climate Trends and Variations Bulletin* (CTVB) for Canada.[4] To compile a set of data that reflects both the national and regional variations, precipitation data from approximately 470 stations were used. These data are housed in the *Adjusted and Homogenized Canadian Climate Data* (AHCCD)[5] archives.

The precipitation data adjustment methods used by Environment Canada follow the steps described in Mekis and Vincent.[6] Precipitation data were evaluated for any known issues due to deficiencies or changes in observation procedures or instrumentation. Adjustments were made to rain and snow measurements separately. Corrections were made to each rain gauge type to account for wind undercatch, evaporation, and gauge specific wetting losses. Snowfall is the depth of newly fallen snow, measured using a snow ruler and converted to water equivalent with the aid of the density correction factors derived from Nipher[7] gauges. Traces of precipitation are also accounted for. Monthly total precipitation was calculated by adding the station's daily rain gauge and snow ruler observations over the month.

For each station, monthly precipitation percentage departures were computed by subtracting the monthly precipitation normal from the actual monthly total precipitation, then dividing the difference by the normal and multiplying by 100 to get the value in percent. The 1961 to 1990 normal[8] is used in the calculations. In order to obtain annual departures, monthly precipitation and monthly normals are added over the 12 months (January to December), while for seasonal departures they are added for each season defined as follows: winter (December of the previous year, January, February), spring (March, April, May), summer (June, July, August), and fall (September, October, November).

Using departures rather than actual observations makes it possible to relate all regional data to the same reference point. Since weather stations are not evenly distributed across the country, the precipitation departures are first interpolated to evenly spaced grid points using Gandin's Optimal Interpolation[9] method covering the entire country. Annual, seasonal and monthly precipitation departures are interpolated to individual grid points separately. The gridded point departure values are averaged within the geographic boundaries of each climatic region and for Canada as a whole (see Map 1).

The annual and seasonal data were tested for the presence of serial correlation and for anomalous observations (outliers). A Statistical Analysis Software (SAS) procedure, PROC ARIMA, was used to compute the overall trend. The PROC ARIMA process produces a linear trend and the associated significance level adjusted for any existing serial correlation and anomalous observations.[10] This study presents only original percent precipitation departure from normal and PROC ARIMA-produced linear trends. All of the linear trends shown are statistically significant[11] unless otherwise noted.

Results

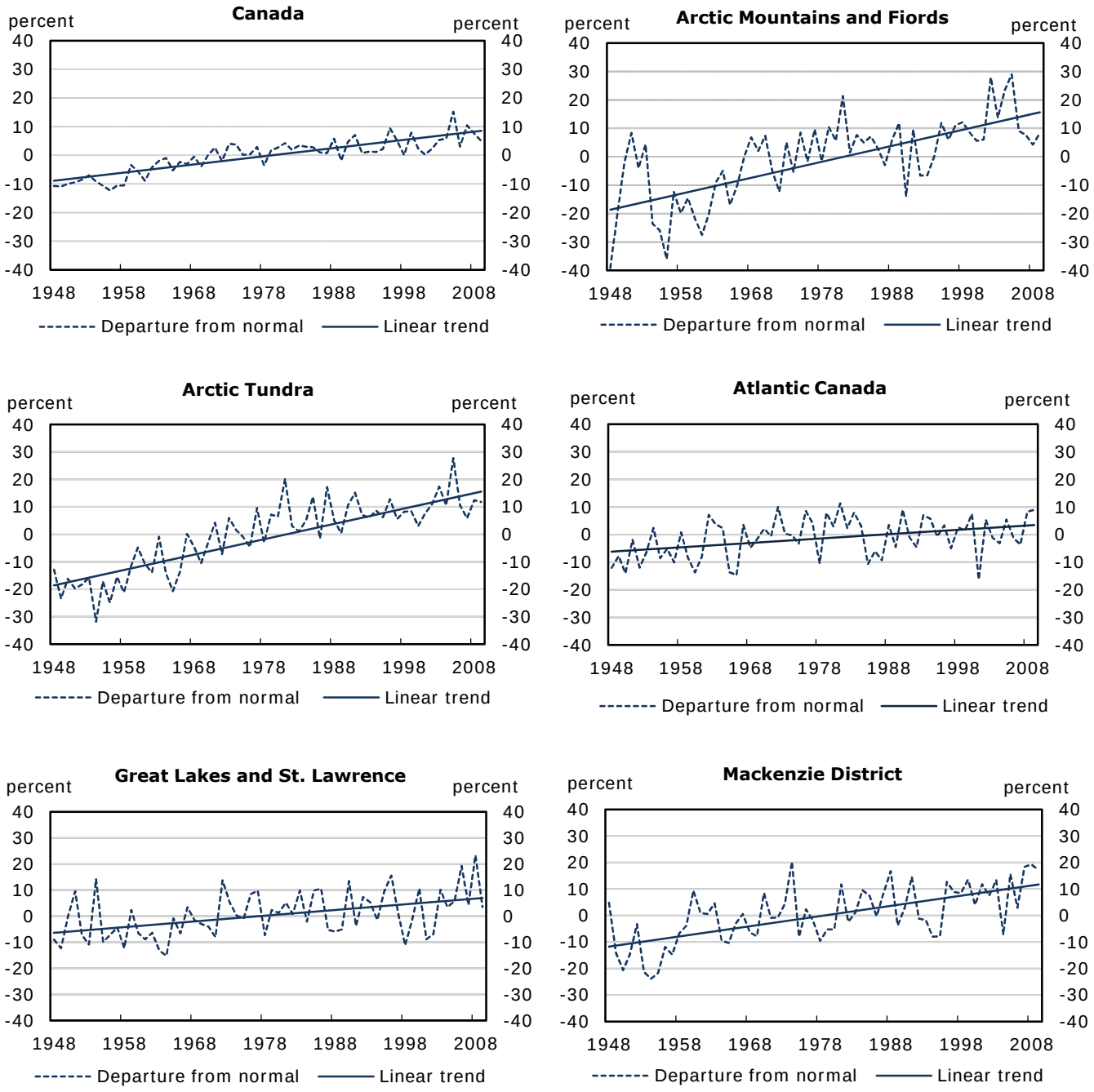
National

Analysis of the national annual precipitation time series (Chart 1) shows an increasing trend across Canada over the period 1948 to 2009 resulting in an increase of 17 percentage points.[12] Compared to the 1961 to 1990 normal, the national precipitation trend has gone from drier to wetter over the course of the study period. The annual precipitation departure trend was 8% above the normal in 2009.

4. Environment Canada, 2011, *Climate Trends and Variations*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed June 15, 2011).
5. Environment Canada, 2010, *Adjusted and Homogenized Canadian Climate Data (AHCCD)*, *http://ec.gc.ca/dccha-ahccd/default.asp?lang=En&n=B1F8423A-1* (accessed June 20, 2011).
6. É. Mekis and L.A. Vincent, 2011, "An Overview of the Second Generation Adjusted Daily Precipitation Dataset for Trend Analysis in Canada," *Atmosphere-Ocean*, Vol. 49, no. 2, pages 163 to 177.
7. The Nipher snow gauge is used to measure snowfall and is much larger than a standard rain gauge or tipping bucket. The Nipher snow gauge provides a more accurate snow water equivalence estimate than standard snow ruler measurements. Environment Canada, 2007, *Nipher Snow Gauge*, *www.on.ec.gc.ca/skywatchers/ontario/wx_office_tour/compound/snow_e.html* (accessed August 17, 2011).
8. The World Meteorological Organization recommends that countries prepare 30-year climate normals for the periods ending in 1930, 1960 and 1990. See: Environment Canada, 2011, *Calculation of the 1971 to 2000 Climate Normals for Canada*, *http://climate.weatheroffice.gc.ca/prods_servs/normals_documentation_e.html* (accessed June 15, 2011).
9. L.S. Gandin, 1965, *Objective Analysis of Meteorological Fields* (Israel Program for Scientific Translation, Trans.) Jerusalem, Israel: S. Monsoon (original work published in 1963).
10. To enquire about the statistical analysis used in this article, contact the information officer (613-951-0297; *environ@statcan.gc.ca*), Environment Accounts and Statistics Division.
11. Statistically significant linear trends to the 95% confidence interval or above.
12. The precipitation data used in this study is based on percentage above or below the normal. Therefore, 'percentage points' are used to describe the change from one period to the next, as this is the unit used to describe the arithmetic difference between two percentages.

Chart 1

Annual mean precipitation percentage departure from 1961 to 1990 normal and linear trend for Canada and climatic regions,[1] 1948 to 2009

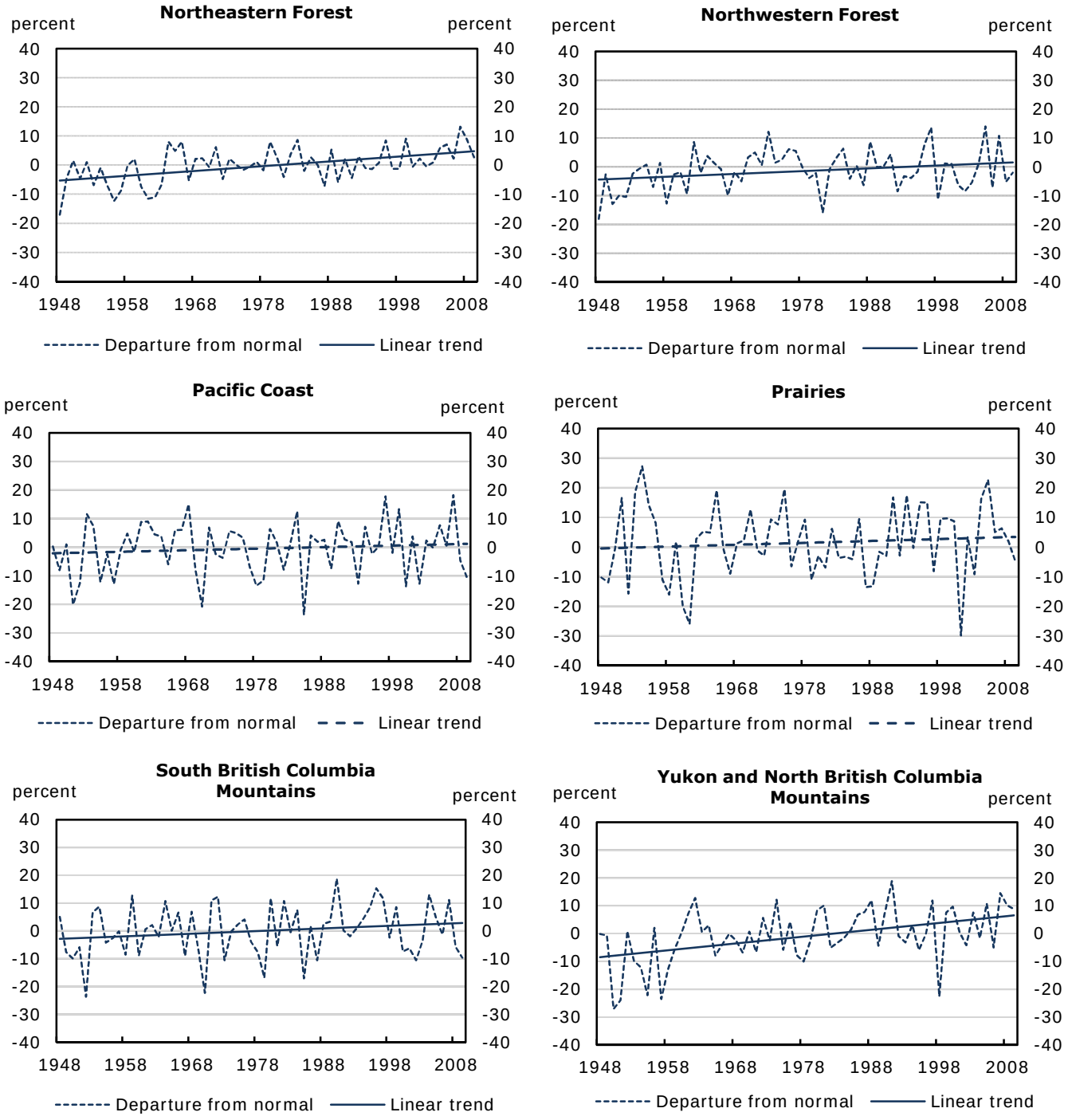


1. See Chart 2 for the following climatic regions: Northeastern Forest, Northwestern Forest, Pacific Coast, Prairies, South British Columbia Mountains, and Yukon and North British Columbia Mountains.

Source(s): Environment Canada, 2010, *Climate Trends and Variations Bulletin (CTVB)*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed February 11, 2011).

Chart 2

Annual mean precipitation percentage departures from 1961 to 1990 normal and linear trend for climatic regions,[1] 1948 to 2009



1. See Chart 1 for Canada and the following climatic regions: Arctic Mountains and Fiords, Arctic Tundra, Atlantic Canada, Great Lakes and St. Lawrence, and Mackenzie District.

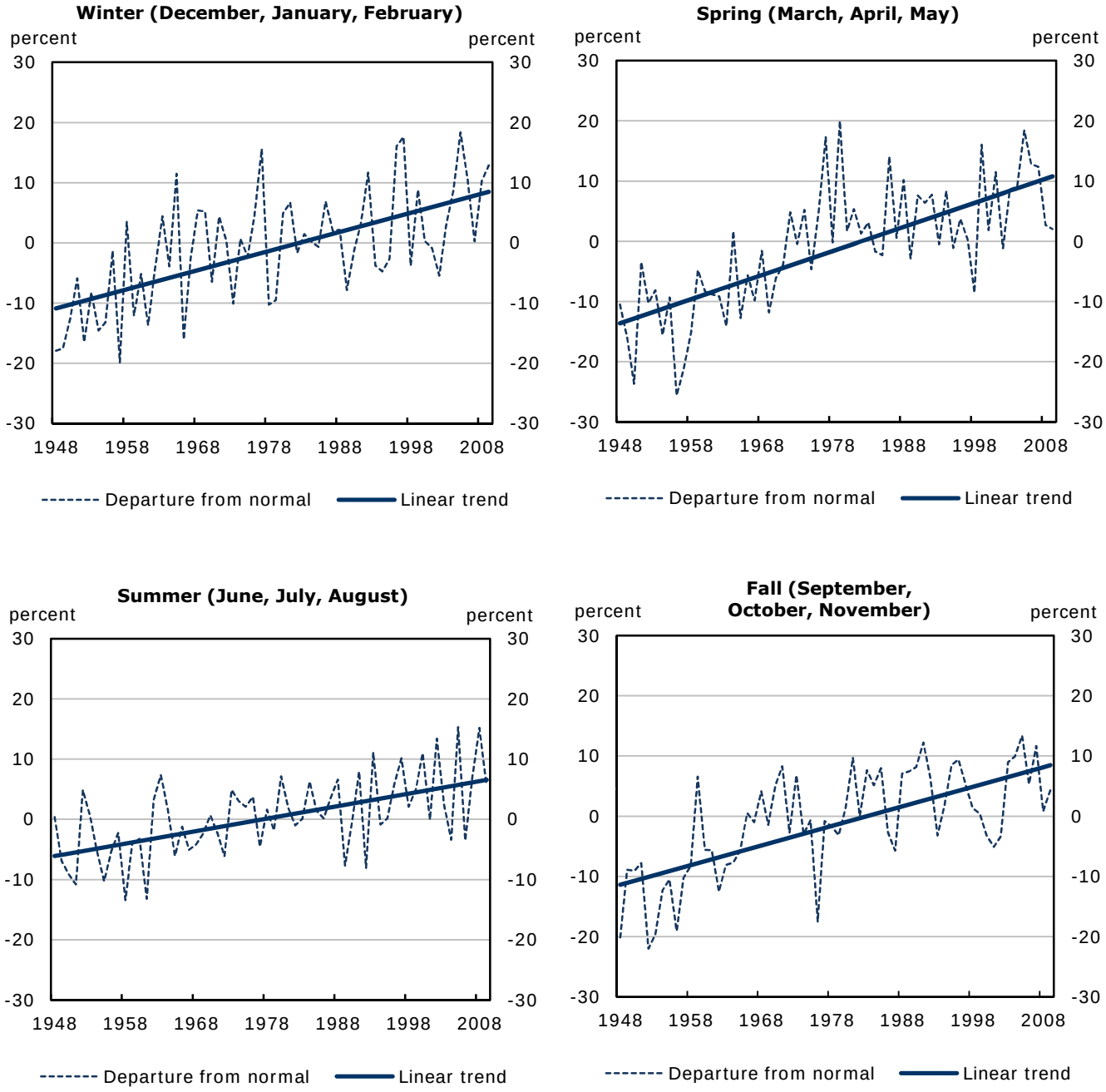
Note(s): Linear trends indicated as dashed line are below the 95% confidence interval.

Source(s): Environment Canada, 2010, *Climate Trends and Variations Bulletin (CTVB)*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed February 11, 2011).

Analysis of the seasonal trends (Chart 3) shows that nationally, precipitation increased overall in all four seasons compared to the normal, with the largest increases in spring (an increase of 24 percentage points for the study period), and the smallest increase in summer (increase of 13 percentage points for the study period).

Chart 3

Seasonal mean precipitation percentage departure from 1961 to 1990 normal and linear trend for Canada, 1948 to 2009



Source(s): Environment Canada, 2010, *Climate Trends and Variations Bulletin (CTVB)*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed February 11, 2011).

Regional Analysis

Annual departure from normal

Most climatic regions (Charts 1 and 2) showed increasing precipitation over the study period compared to the normal, particularly in the northern climatic regions: Arctic Mountain and Fiords (+34 percentage points), Arctic Tundra (+36 percentage points) and Mackenzie District (+23 percentage points). Although some other climatic regions like the Northwestern Forest and South British Columbia Mountains received more precipitation compared to normal over the study period, the trend was not as pronounced. Some climatic regions did not show a positive or negative trend, such as the Pacific Coast and Prairies, indicating these areas did not experience significantly more or less precipitation compared to the normal period.

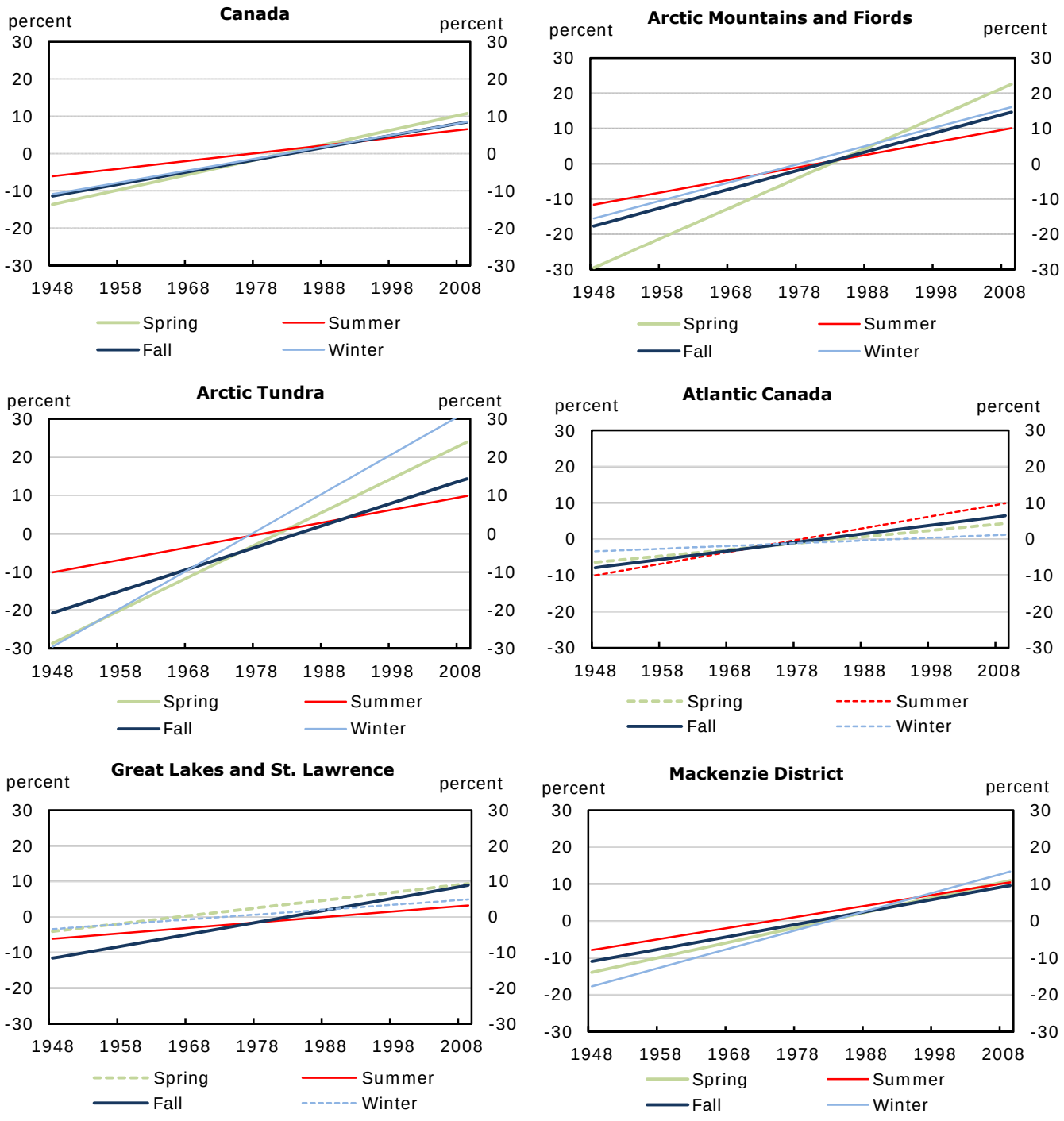
The three climatic regions that make up much of eastern Canada (Great Lakes and St. Lawrence, Northeastern Forest and Atlantic Canada) all had similar precipitation trends. The three regions show an upward trend compared to the normal over the study period.

Seasonal departure from normal

On a seasonal basis (Charts 4 and 5), two of the northern climatic regions (Arctic Mountains and Fiords and Arctic Tundra) had the largest percentage increases in precipitation from 1948 to 2009 compared to the normal. All four seasons in these areas received increasing precipitation, particularly spring (and winter in the Arctic Tundra). The Mackenzie District also received increasing precipitation in all four seasons and particularly in winter. It is important to note that the percentage departure in the north can represent a smaller absolute difference in precipitation due to lower normal precipitation amounts than the same percentage departure in the higher precipitation regions.

Chart 4

Linear trends associated with the seasonal mean precipitation percentage departure from 1961 to 1990 normal for Canada and climatic regions,[1] 1948 to 2009



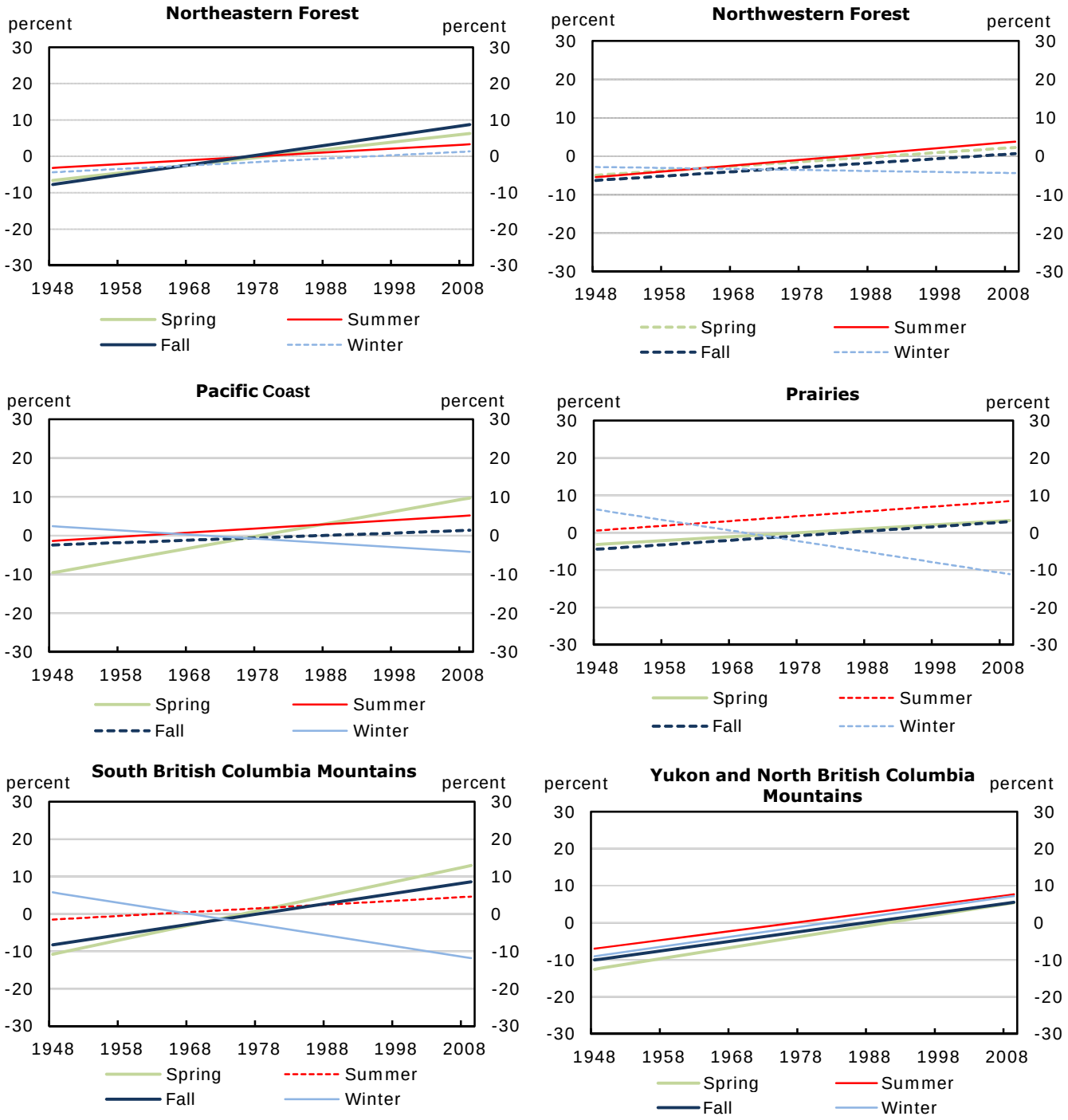
1. See Chart 5 for the following climatic regions: Northeastern Forest, Northwestern Forest, Pacific Coast, Prairies, South British Columbia Mountains, and Yukon and North British Columbia Mountains.

Note(s): Linear trends indicated as dashed line are below the 95% confidence interval.

Source(s): Environment Canada, 2010, *Climate Trends and Variations Bulletin (CTVB)*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed February 11, 2011).

Chart 5

Linear trends associated with the seasonal mean precipitation percentage departure from 1961 to 1990 normal for climatic regions,[1] 1948 to 2009



1. See Chart 4 for Canada and the following climatic regions: Arctic Mountains and Fiords, Arctic Tundra, Atlantic Canada, Great Lakes and St. Lawrence, and Mackenzie District.

Note(s): Linear trends indicated as dashed line are below the 95% confidence interval.

Source(s): Environment Canada, 2010, *Climate Trends and Variations Bulletin (CTVB)*, *www.ec.gc.ca/adsc-cmda/default.asp?lang=En&n=F3D25729-1* (accessed February 11, 2011).

The regional precipitation time series trend for spring increased the most in the Arctic Mountain and Fiords (an increase of 52 percentage points), Arctic Tundra (+53 percentage points), Mackenzie District (+25 percentage points) and South British Columbia Mountains (+24 percentage points) climatic regions. Winter precipitation also increased the most in the north, rising 61 percentage points in the Arctic Tundra, 32 percentage points in the Arctic Mountains and Fiords and 31 percentage points in the Mackenzie District.

Over the study period, the Pacific Coast (-7 percentage points), and South British Columbia Mountains (-18 percentage points) climatic regions experienced decreased precipitation during winter, but data show increased precipitation during spring (+24 percentage points) and fall (+17 percentage points) in the South British Columbia Mountains and during spring (+19 percentage points) and summer (+7 percentage points) in the Pacific Coast as compared to the normal period. The results did not show a significant trend for fall precipitation in the Pacific Coast and summer precipitation in the South British Columbia Mountains.

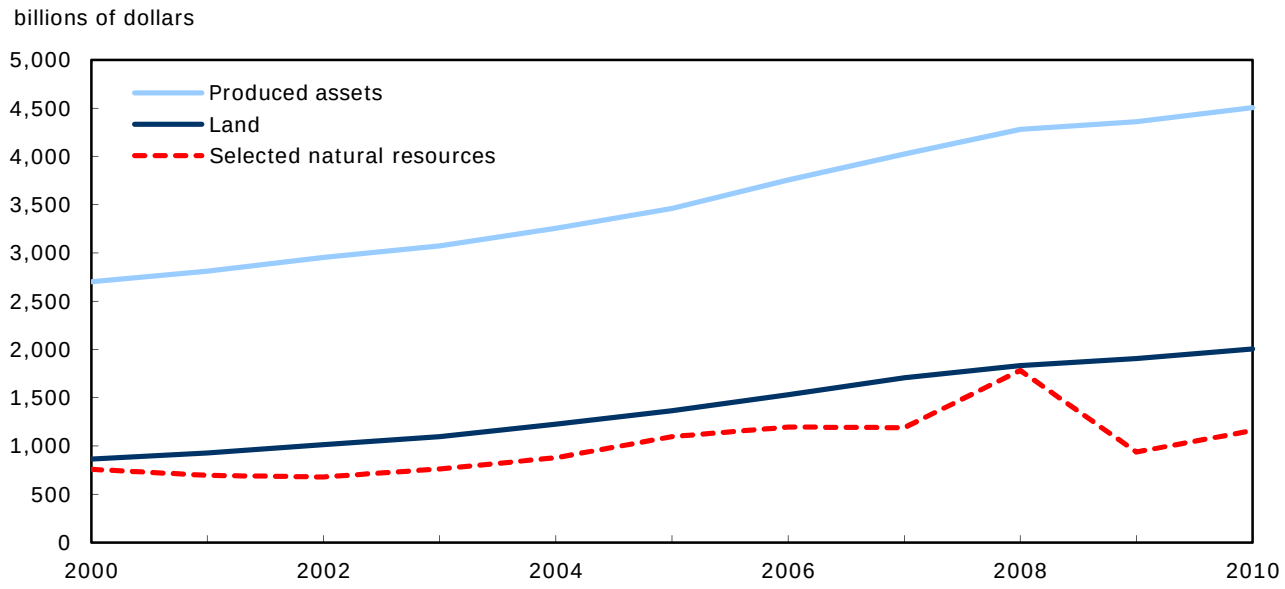
As noted earlier, the Prairies climatic region did not show a significant trend at the annual level. Seasonally, only the spring season showed a statistically significant percentage increase in precipitation but the rate of increase was below the national average. The analysis also indicated that winters were receiving less precipitation over the study period, but the results were less statistically significant.

Natural resource wealth, 2010

Kazi Islam, Patrick Adams and Michael Wright, Environment Accounts and Statistics Division

Canada is endowed with substantial reserves of natural resources, from energy and minerals in the ground to accessible stands of timber in forests. Fuelled by increased world demand for energy and minerals, natural resource wealth—defined as the value of selected[13] natural resource reserves—grew in 2010 following a decline in 2009 due to the global economic downturn. In 2010, natural resource wealth stood at $1.16 trillion or $34,000 per capita,[14] representing 15% of Canada's non-financial wealth[15]—equal to the sum of produced assets,[16] land and natural resource assets (Chart 6).

Chart 6
Value of non-financial assets



Source(s): Statistics Canada, CANSIM table 378-0005 (accessed September 20, 2011).

Like land and produced assets, natural resource wealth plays a significant role in generating income, exports, and employment.[17] This article provides a brief overview of recent trends in Canada's natural resource wealth.

13. Energy resources (natural gas, crude oil, crude bitumen and coal), mineral resources (gold, nickel, copper, zinc, lead, iron, molybdenum, uranium, potash and diamonds) and timber. Other natural resource stocks, including water and fish, are not currently valued due to data limitations.
14. Statistics Canada, CANSIM tables 378-0005 and 051-0001 (accessed September 20, 2011).
15. For details, see: Statistics Canada, 2011, *National balance sheet accounts*, *www.statcan.gc.ca/daily-quotidien/110314/dq110314a-eng.htm* (accessed July 7, 2011).
16. Produced assets include residential and non-residential structures, machinery and equipment, consumer durables and inventories.
17. For more information, see: P. Cross, 2008, "The role of natural resources in Canada's economy," *Canadian Economic Observer*, Statistics Canada Catalogue no. 11-010-X, Vol. 21, no. 11.

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; for example, reserves of metal ore in the ground or accessible stands of timber in forests. For mineral and energy resources, reserves are defined by the amount of proven and probable stocks that are profitable to extract using available technology. For timber resources, only the stocks that are physically accessible and available for harvesting are accounted for.

The approach taken to value resources is similar to that of valuing an annuity—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 capital costs, such as wear-and-tear on machinery. Apart from these costs, businesses also pay fees, taxes and royalties to various levels of government. These payments implicitly represent rent and, hence, are not deducted from sales revenue.

Next, 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 it were in hand today, all future rents must be discounted before being summed together. This method is widely used by other countries to estimate natural resource wealth and is consistent with international statistical best practice.

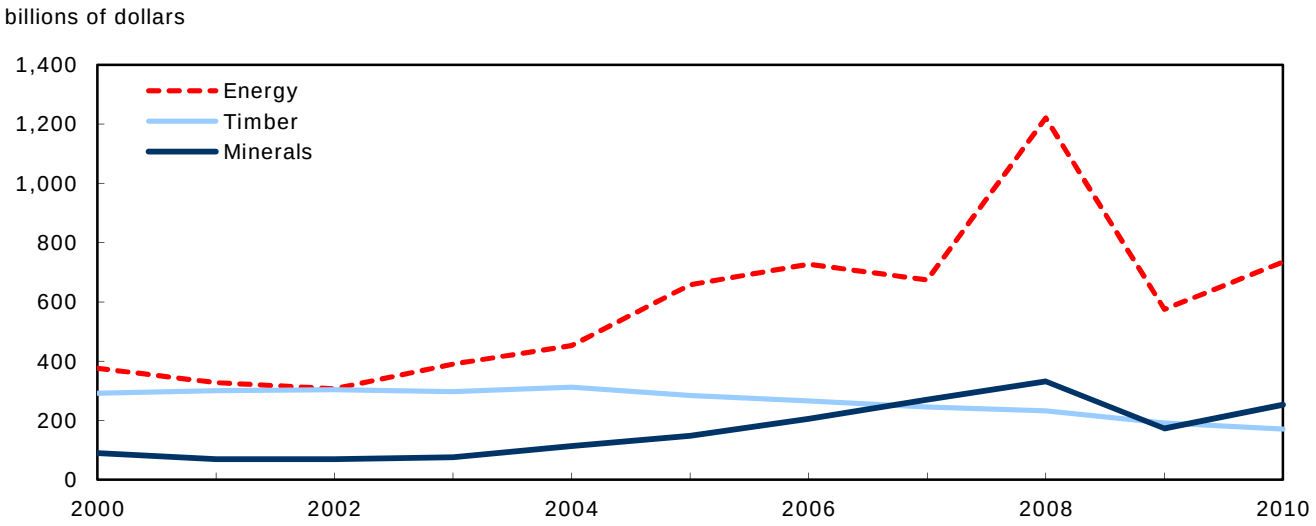
For more information please see *Definitions, data sources and methods: Natural Resource Stock Accounts.*

Natural resource wealth bounces back

Natural resource wealth is more volatile than other types of wealth. Natural resource prices[18] are determined by global demand and supply while the value of land and produced assets is more influenced by domestic market conditions. Owing to a variety of factors, such as high global demand, geopolitical risks and the depreciation of the U.S. dollar, oil prices reached an all-time high during the first ten months of 2008.[19] In the summer of 2008 the price of oil grew to around US$150 per barrel only to drop to US$40 per barrel a few months later. This is reflected in the value of energy resource wealth (Chart 7).

18. A notable exception is the price of natural gas, which largely depends on domestic markets as much of natural gas is transported through pipelines.
19. For details, see: S. Brown, R. Virmani and R. Alm, 2008, "Crude Awakening: Behind the Surge in Oil Prices," *Economic Letters*, Federal Reserve Bank of Dallas, Vol. 3, no. 5, *http://dallasfed.org/reserach/eclett/2008/el0805.html* (accessed July 7, 2011).

Chart 7
Value of energy, minerals and timber reserves



Source(s): Statistics Canada, CANSIM table 378-0005 (accessed September 20, 2011).

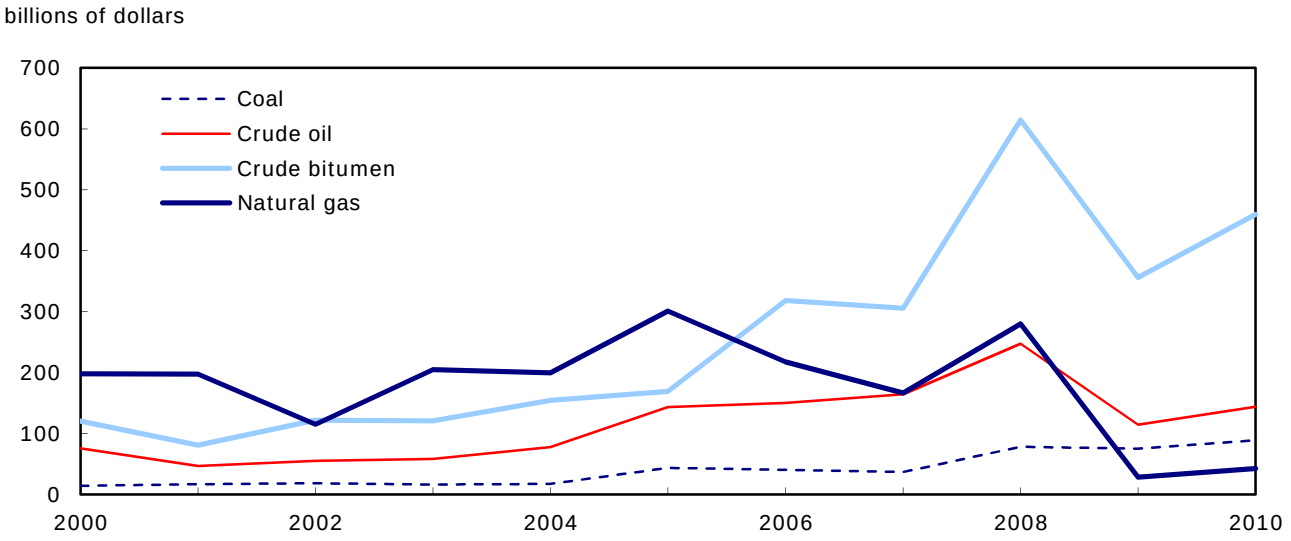
In 2009, natural resource wealth dropped in the face of the global economic downturn. In 2010, this wealth regained some of its losses as global demand began to recover. Both energy and mineral resources contributed to the upturn; in 2010, energy resources accounted for 63% of total natural resource wealth; mineral and timber resources accounted for 22% and 15% respectively.

Oil sands drive energy wealth

In 2010, the value of crude bitumen (oil sands) reserves stood at $460 billion, accounting for 63% of total energy wealth. Crude oil (conventional oil), which had a higher average price in the year, represented about 20% of energy wealth in 2010 (Chart 8).[20] This difference in share reflects the larger size of crude bitumen reserves as compared to crude oil reserves.[21,22]

20. In 2010, the price per m^3 of heavy crude oil, light and medium crude oil and crude bitumen were $396, $470 and $372 respectively. See Alberta Energy and Utilities Board, n.d. (no date), *Oil Prices – 2010*, *www.ercb.ca/docs/products/STs/st3/2010/Prices_oil_2010.pdf* (accessed June 20, 2011).
21. Crude oil and crude bitumen reserves valued in this study include 'known reserves under active development.'
22. In 2006, estimates of oil sands reserves under active development doubled as compared to 2005. See Alberta Energy and Utilities Board, 2007, *Alberta's Energy Reserves 2006 and Supply/Demand Outlook 2007-2016,* Report no. ST 98-2007, table 2.1, *www.ercb.ca/docs/products/STs/st98-2007.pdf* (accessed June 15, 2011).

Chart 8
Value of energy resource reserves



Source(s): Statistics Canada, CANSIM tables 153-0001, 153-0002, 153-0003, 153-0004 and 153-0005 (accessed September 20, 2011).

In 2010, oil sands reserves under active development amounted to around 4,130 million m^3—one of the largest hydrocarbon deposits in the world.

Natural gas wealth has yet to recover from its drop in 2009, due to lower prices. The value of coal reserves has remained steady since 2008.

Ecoregion profile: Eastern Vancouver Island

Iman Mustapha, Environment Accounts and Statistics Division

The Eastern Vancouver Island ecoregion is part of the larger Pacific Maritime ecozone that stretches along the entire coast of British Columbia, from the Yukon in the north, to the city of Victoria in the south (Map 2). Rainfall in this ecozone can exceed 3,000 mm a year. As part of this ecozone, the Eastern Vancouver Island ecoregion is located on the leeward[23] side of Vancouver Island's mountain ranges and as such receives less precipitation than the neighbouring windward[24] Western Vancouver Island ecoregion. The ecoregion is characterized by mixed terrain with areas of sharp crests and narrow valleys and covers an area of more than 13,200 km^2, which is smaller than the average Canadian ecoregion of 45,000 km^2.

This region was the seventh most densely populated ecoregion in Canada in 2006, with 50 persons per km^2. The population was 659,342 people in 2006, representing an 86% increase from 1971 (Table 2). The main population centres in the ecoregion include Victoria, Nanaimo, Courtenay, Campbell River and Port Alberni. This region's settled area[25] in 2006 was 612 km^2, an increase of 11.5% from 2001. Coniferous forests are the dominant land cover, making up 68.9% of the surface area (Chart 9, Map 3 and Table 2). Deciduous forests cover 3.0% of the ecoregion. Coniferous forests include Douglas-fir, western hemlock and grand fir, while deciduous forests are composed mainly of Garry oak.

Grasses cover 9.4% of the ecoregion, followed by shrubland (5.8%), developed land (4.2%) and water (3.6%). In 2010, the protected area in this ecoregion was 2,003 km^2, or 15.2% of the total area (Table 2).

The labour force for the ecoregion was made up of more than 336,200 people in 2006, a 7.3% rise from 2001. The growth rate for the Canada-wide labour force over the same period was 8.0% (Table 2). The fastest growing employment category was construction and utilities with a 41.7% rise over 2001. Over the same period, manufacturing declined by 9.2%. Public administration, management and other services was the largest category in 2006, making up 18.7% of the total labour force, reflecting the presence of government institutions. This was followed closely by educational and health care services (18.2%) and retail and wholesale trade at 14.6% (Chart 10).

The labour force in primary industries in this ecoregion (agriculture, forestry, fishing, hunting, mining and oil and gas extraction) decreased by 7.2% between 2001 and 2006.

23. Leeward refers to an area located on or towards the side sheltered from the wind or rain.
24. Windward refers to an area exposed to both wind and rain.
25. Settlements can be defined as tracts of land where humans have altered the physical environment by constructing residential, commercial and institutional buildings and the associated infrastructure of roads and public spaces. Settlements include cities, towns, villages and other dense concentrations of human population. For more information on settlements please see: N. Hofmann, A. Elgarawany, H. Larocque, G. Filoso and T. Dennis, 2010, "Introducing a New Concept and Methodology for Delineating Settlement Boundaries: A Research Project on Canadian Settlements," *Environment Accounts and Statistics Analytical and Technical Paper Series*, Statistics Canada Catalogue no. 16-001-M, no. 11.

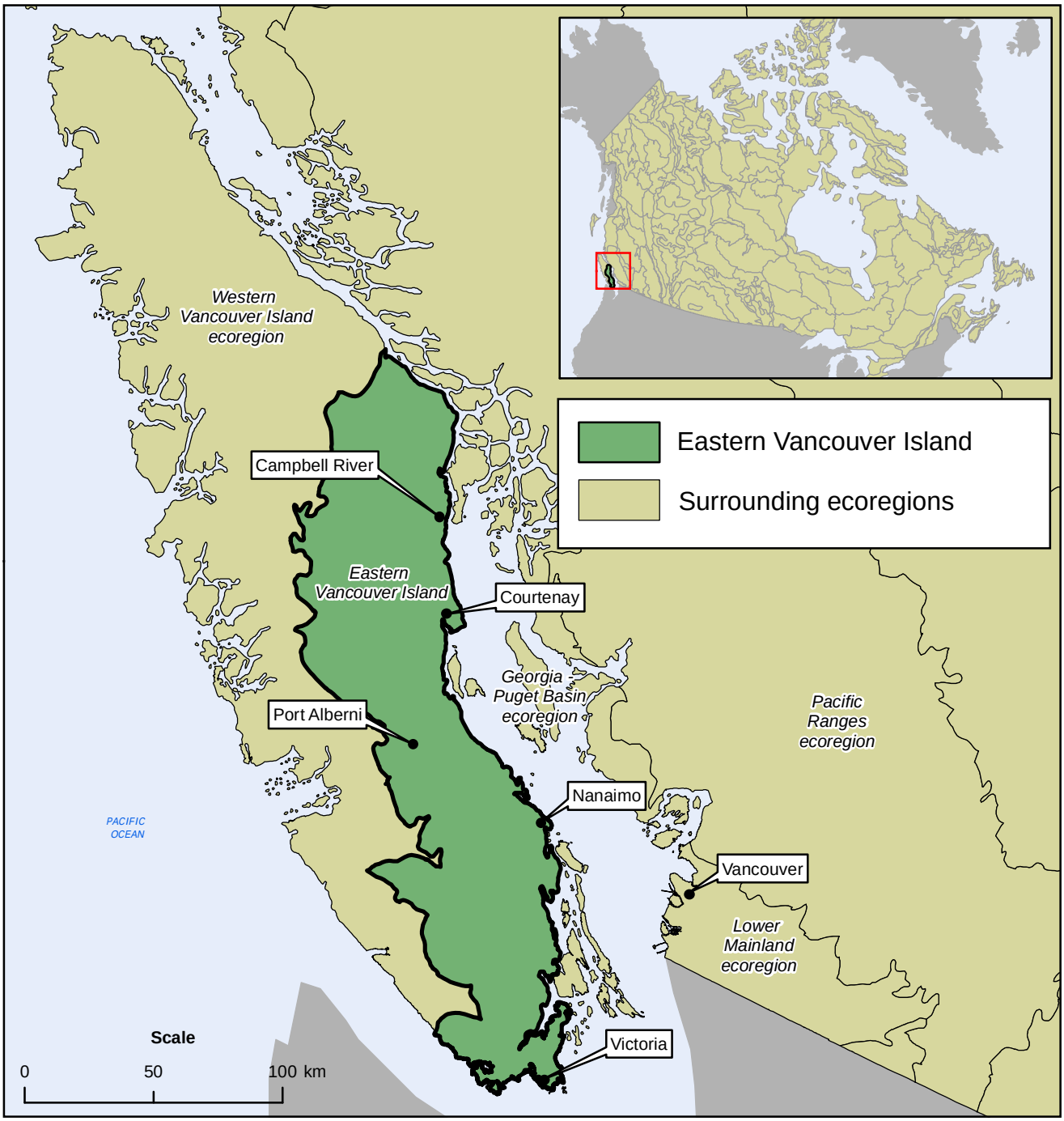
Table 3 illustrates labour force estimates for selected primary industries in British Columbia from 1990 to 2010.[26]

From 2001 to 2006, the labour force in the forestry and logging and associated support activities category declined by 22.5%, while the fishing and hunting category went down by 42.9% for the province as a whole.

Agriculture in the ecoregion contributed $151 million (0.4%) to Canada's total farm sales of $42.2 billion in 2005 (Table 2). Total farmland area—which includes cropland, summerfallow and pasture lands—increased by 4.1% in the ecoregion from 38,283 hectares in 1971 to 39,837 hectares in 2006. This increase went against the Canadian trend, which saw a 1.6% decline over the same period. Between 1971 and 2006, the number of farms in the ecoregion increased by 43.6% to 2,310. During the same period, the number of cattle rose 3.5% to 24,073.

26. Detailed primary industry data is not available at the ecoregion level; therefore labour force statistics have been used at the provincial level to support sub-industry fluctuations in British Columbia.

Map 2
Eastern Vancouver Island ecoregion



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

Table 2
Eastern Vancouver Island ecoregion

	Eastern Vancouver Island ecoregion	Canada	Percentage share of Canada total
Total area (km²)	**13,214**	**9,976,182**	**0.1**
Land cover circa 2000 [1, 2]			
Annual cropland (km²)	32	..	…
Perennial cropland and pasture (km²)	132	..	…
Coniferous forest (km²)	9,100	..	…
Deciduous forest (km²)	394	..	…
Developed land (km²)	554	..	…
Water (km²)	470	..	…
Grasses (km²)	1,240	..	…
Shrubland (km²)	762	..	…
Wetland (km²)	70	..	…
Snow and ice (km²)	345	..	…
Other classes (km²)	115	..	…
Agricultural land			
Area of dependable agricultural land [3] (km²)	210	454,630	0.0
Proportion of area in dependable land (percent)	1.6	4.6	…
Protected areas			
Area of protected land and fresh water in 2010 (km²)	2,003	975,816	0.2
Proportion of area protected (percent)	15.2	9.8	…
Settled areas [4]			
Settled areas in 2001 (km²)	549	14,038	3.9
Settled areas in 2006 (km²)	612	16,019	3.8
Change in settled areas 2001 to 2006 (percent)	11.5	14.1	…
Population			
Population in 1971 (number)	354,359	21,568,311	1.6
Population in 1981 (number)	456,077	24,343,181	1.9
Population in 1991 (number)	547,583	27,296,859	2.0
Population in 1996 (number)	607,963	28,846,761	2.1
Population in 2001 (number)	619,727	30,007,089	2.1
Population in 2006 (number)	659,342	31,612,897	2.1
Population density in 2006 (people/km²)	49.9	3.2	…
Change in population 1971 to 2006 (percent)	86.1	46.6	…
Labour force [5] **by industry, 2001 and 2006**			
Primary industries [6] in 2001	13,570	737,630	1.8
Primary industries [6] in 2006	12,595	762,460	1.7
Change in primary industries [6] (percent)	-7.2	3.4	…
Construction and utilities in 2001	18,960	998,040	1.9
Construction and utilities in 2006	26,870	1,202,045	2.2
Change in construction and utilities (percent)	41.7	20.4	…
Manufacturing in 2001	20,745	2,174,285	1.0
Manufacturing in 2006	18,835	2,005,980	0.9
Change in manufacturing (percent)	-9.2	-7.7	…
Retail and wholesale trade 2001	46,250	2,441,410	1.9
Retail and wholesale trade 2006	49,125	2,656,475	1.8
Change in retail and wholesale trade (percent)	6.2	8.8	…
Transportation and warehousing in 2001	12,775	774,220	1.7
Transportation and warehousing in 2006	12,175	820,195	1.5
Change in transportation and warehousing (percent)	-4.7	5.9	…
Information, culture and recreation in 2001	13,760	721,150	1.9
Information, culture and recreation in 2006	14,475	763,640	1.9
Change in information, culture and recreation (percent)	5.2	5.9	…
Finance, scientific and real estate services in 2001	28,235	1,877,290	1.5
Finance, scientific and real estate services in 2006	38,775	2,115,165	1.8
Change in finance, scientific and real estate services (percent)	37.3	12.7	…
Educational and health care services in 2001	59,125	2,532,380	2.3
Educational and health care services in 2006	61,310	2,866,790	2.1
Change in educational and health care services (percent)	3.7	13.2	…

See notes at the end of the table.

Table 2 – continued

Eastern Vancouver Island ecoregion

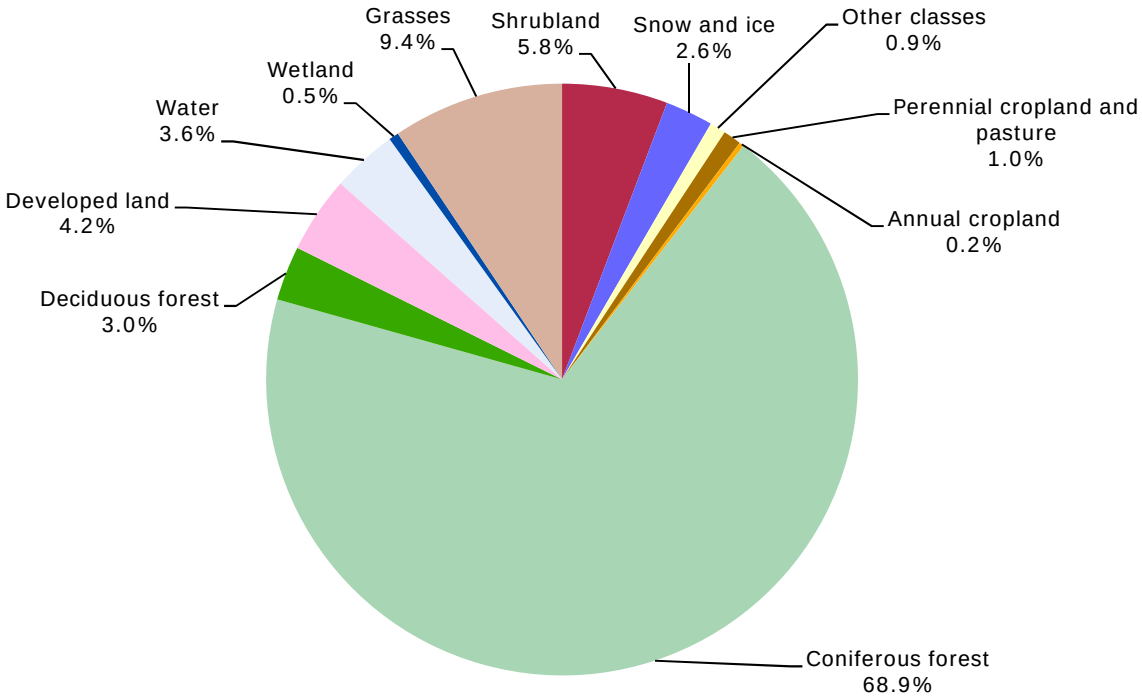
	Eastern Vancouver Island ecoregion	Canada	Percentage share of Canada total
Accommodation and food services in 2001	26,290	1,046,045	2.5
Accommodation and food services in 2006	28,105	1,126,695	2.5
Change in accommodation and food services (percent)	6.9	7.7	…
Public administration, management and other services [7] in 2001	59,860	2,274,115	2.6
Public administration, management and other services [7] in 2006	62,720	2,541,725	2.5
Change in public administration, management and other services [7] (percent)	4.8	11.8	…
Total labour force [8] in 2001	313,420	15,872,070	2.0
Total labour force [8] in 2006	336,255	17,146,135	2.0
Change in total labour force [8] (percent)	7.3	8.0	…
Agriculture			
Area of farmland in 1971 (hectares)	38,283	68,662,444	0.1
Area of farmland in 2006 (hectares)	39,837	67,586,739	0.1
Change in area of farmland (percent)	4.1	-1.6	…
Farms in 1971 (number)	1,609	366,128	0.4
Farms in 2006 (number)	2,310	229,373	1.0
Change in number of farms (percent)	43.6	-37.4	…
Cattle in 1971 (number)	23,270	13,276,308	0.2
Cattle in 2006 (number)	24,073	15,773,527	0.2
Change in number of cattle (percent)	3.5	18.8	…
Gross farm sales (excluding forest products) 2005 (thousands of current dollars)	150,950	42,191,981	0.4

1. Some land cover classes are aggregated. 'Developed land' includes built-up areas, lawns, road surfaces, industrial sites and farmsteads. 'Other' refers to unclassified land types due to shadow and clouds in the satellite imagery. 'Snow and ice' refers to land with snow and ice throughout the year. Land cover is based on LANDSAT satellite data from 1996 to 2003.
2. Land cover statistics have not been compiled nationally from this source.
3. Dependable agricultural land is defined as land designated as Class 1, Class 2 and Class 3 by the Canada Land Inventory.
4. Settlements can be defined as tracts of land where humans have altered the physical environment by constructing residential, commercial and institutional buildings and the associated infrastructure of roads and public spaces. Settlements include cities, towns, villages and other dense concentrations of human population. The methodology used for delineating settlements in Canada was made possible through the analysis of data extracted from satellite imagery and the use of census data. For more information on settlements please see: N. Hofmann, A. Elgarawany, H. Larocque, G. Filoso and T. Dennis, 2010, "Introducing a New Concept and Methodology for Delineating Settlement Boundaries: A Research Project on Canadian Settlements," *Environment Accounts and Statistics Analytical and Technical Paper Series*, Statistics Canada Catalogue no. 16-001-M, no. 11.
5. Refers to persons who were either employed or unemployed during the reference week (Sunday to Saturday) prior to Census Day (May 16, 2006).
6. Includes agriculture, forestry, fishing and hunting; and mining and oil and gas extraction.
7. Includes management of companies and enterprises; administrative and support, waste management and remediation services; other services (except public administration); and public administration.
8. Figures do not add up to the total due to suppression and random rounding of confidential data.

Source(s): Statistics Canada, CANSIM table 153-0057 (accessed October 8, 2009). Statistics Canada, Census of Population and Census of Agriculture. Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System. Natural Resources Canada, 2008, *Canada Land Inventory—Land Capability for Agriculture*, Earth Sciences Sector, *www.geogratis.ca/geogratis/en/collection/cli.html* (accessed October 8, 2009). Natural Resources Canada, 2009, *Land Cover, Circa 2000-Vector*, Earth Sciences Sector, *www.geobase.ca/geobase/en/data/landcover/index.html* (accessed October 8, 2009). Agriculture and Agri-Food Canada, 2010, *A National Ecological Framework for Canada*, *http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html* (accessed February 19, 2010). Canadian Council on Ecological Areas, 2010, *Conservation Areas Reporting and Tracking System (CARTS)*, *www.ccea.org/en_carts.html* (accessed April 21, 2010).

Chart 9

Eastern Vancouver Island ecoregion, land cover by type, circa 2000

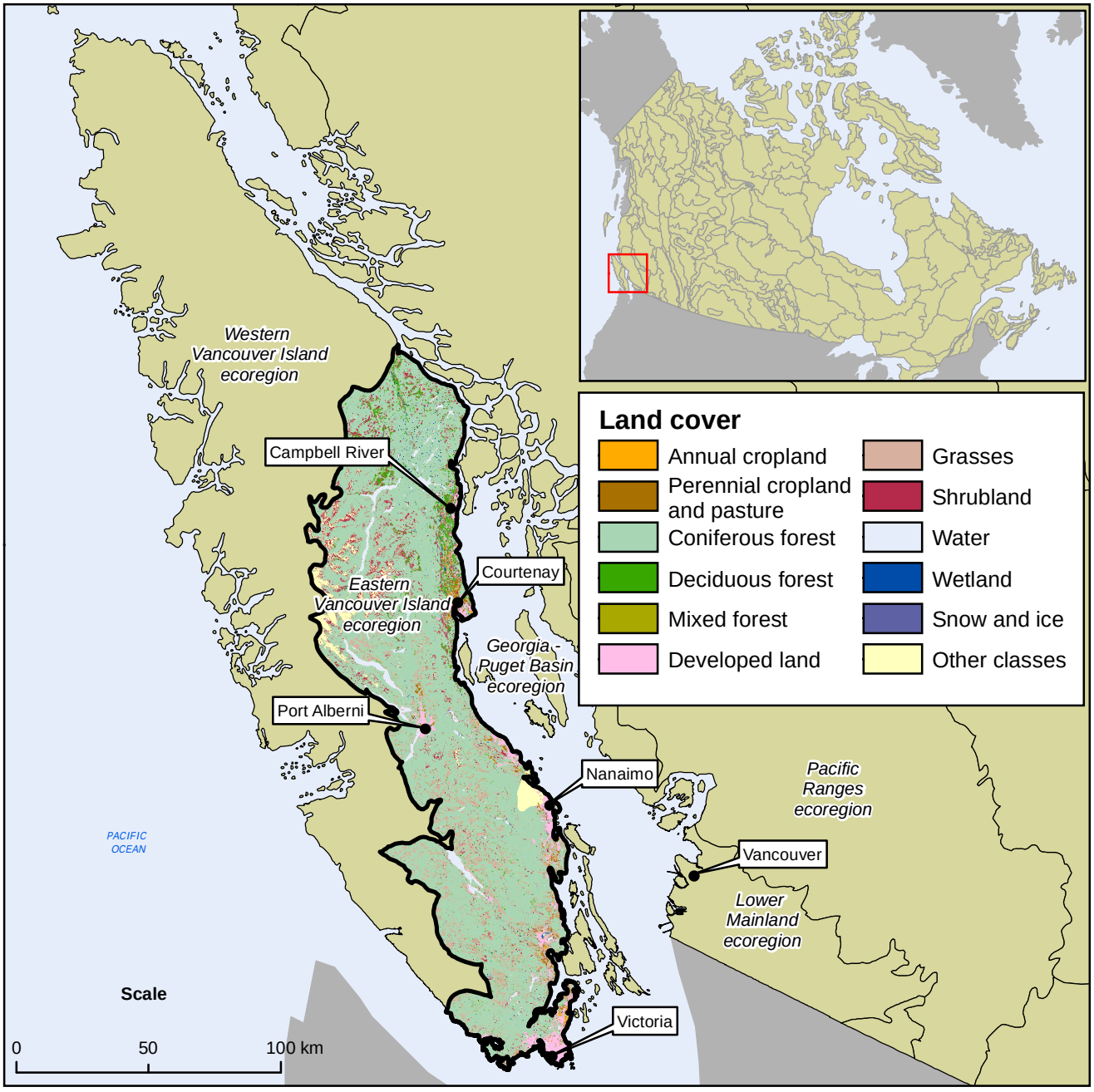


Note(s): 'Developed land' includes built-up areas, lawns, road surfaces, industrial sites and farmsteads. 'Other' refers to unclassified land types due to shadow and clouds in the satellite imagery. 'Snow and ice' refers to land with snow and ice throughout the year. Land cover is based on LANDSAT satellite data from 1996 to 2003.

Source(s): Natural Resources Canada, 2009, *Land cover, Circa 2000 - Vector*, Earth Sciences Sector, *www.geobase.ca/geobase/en/data/landcover/index.html* (accessed October 8, 2009).

Map 3

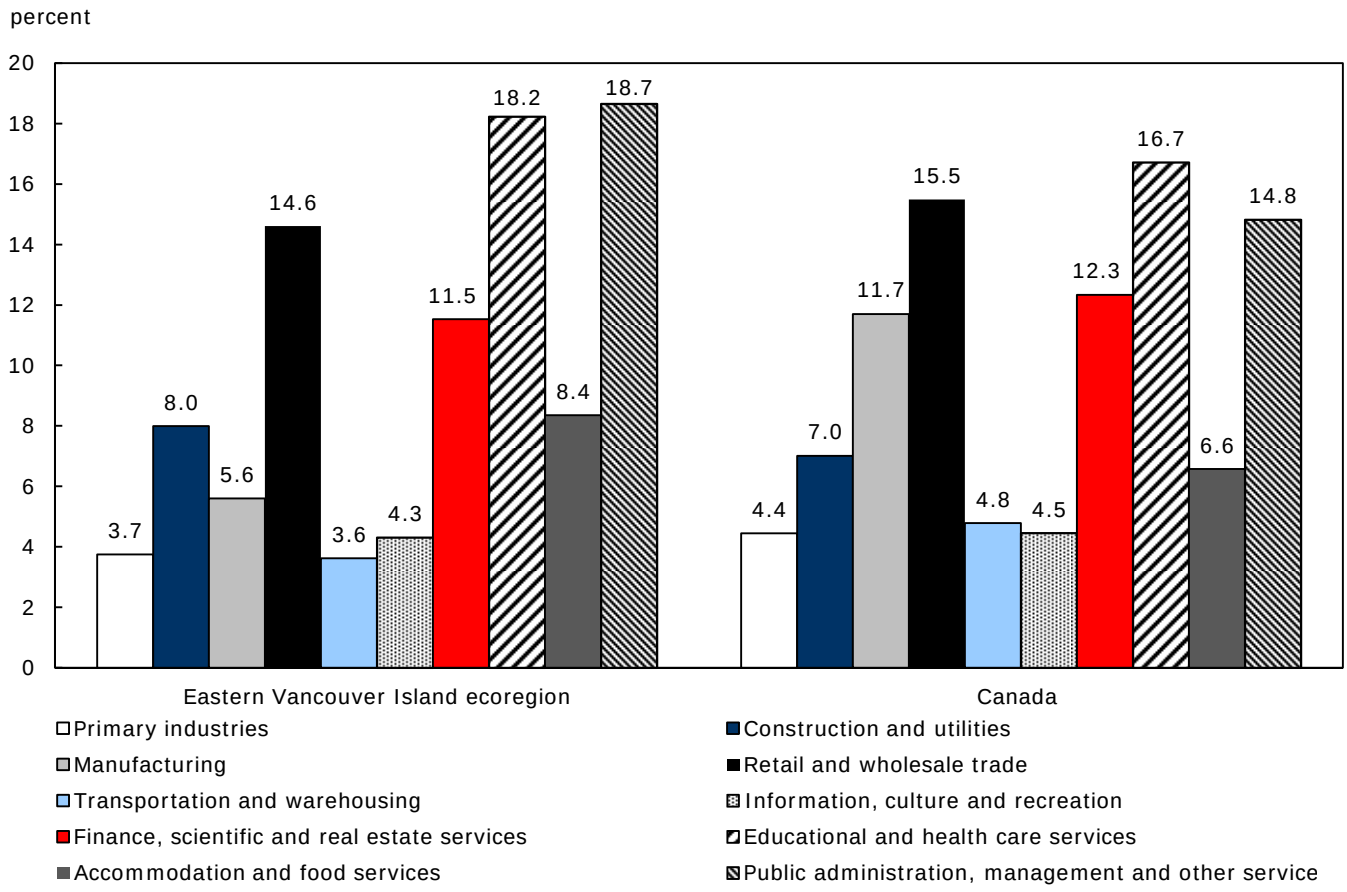
Land cover, Eastern Vancouver Island ecoregion, circa 2000



Note(s): Some land cover classes are aggregated. 'Developed land' includes built-up areas, lawns, road surfaces, industrial sites and farmsteads. 'Other' refers to unclassified land types due to shadow and clouds in the satellite imagery. 'Snow and ice' refers to land with snow and ice throughout the year. Land cover is based on LANDSAT satellite data from 1996 to 2003.

Source(s): Natural Resources Canada, 2009, *Land Cover, Circa 2000-Vector (LCC2000-v)*, Earth Sciences Sector, www.geobase.ca (accessed October 8, 2009).
Agriculture and Agri-Food Canada, 2008, *A National Ecological Framework for Canada*, http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html (accessed February 19, 2010).

Chart 10
Labour force by industry, 2006



Note(s): 'Primary industries' includes agriculture, forestry, fishing and hunting; and mining and oil and gas extraction. 'Public administration, management and other services' includes management of companies and enterprises; administrative and support, waste management and remediation services; other services (except public administration); and public administration. Percentages do not add up to 100% due to suppression and random rounding of confidential data.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, 2010, special tabulation of data from the 2006 Census of Population.

Table 3
Labour force estimates for selected primary industries in British Columbia

	Forestry and logging with support activities	Fishing, hunting and trapping
	thousands of persons	
1990	32.0	8.5
1995	42.1	5.9
2000	40.1	4.7
2001	29.8	5.6
2002	29.5	4.2
2003	31.4	5.1
2004	24.1	3.3
2005	23.7	2.5
2006	23.1	3.2
2007	26.0	3.3
2008	19.1	2.5
2009	17.3	3.0
2010	18.3	2.3
Change 2001 to 2006 (percent)	-22.5	-42.9

Source(s): Statistics Canada, CANSIM table 282-0008 (accessed July 20, 2011).

Quick fact

Burning of yard waste in 2009

The burning of yard waste can release particulate matter and other forms of air pollution that can have adverse impacts on health, particularly on days when the air quality is poor.[27] In 2009, almost three-quarters of Canadian households (73%) did not live in an apartment and had a lawn or garden. More than one in ten of these households (12%) reported that they burned yard waste on their property, with Quebec (18%) and New Brunswick (17%) having the highest proportion of households doing this. The burning of yard waste was reported less frequently by households in larger metropolitan centres where the activity is usually banned.

Table 4
Burning of yard waste, Canada and provinces, 2009

	Had a lawn or garden [1]	Yard waste was burned on the property in the last 12 months [2]
	percent	
Canada	**73**	**12**
Newfoundland and Labrador	86	10 E
Prince Edward Island	81	F
Nova Scotia	85	15
New Brunswick	86	17
Quebec	64	18
Ontario	75	8
Manitoba	73	15
Saskatchewan	77	8 E
Alberta	78	13
British Columbia	71	12

1. Households that were not in an apartment and had a lawn or garden as a percentage of all households.
2. As a percentage of households that were not in apartments and had a lawn or garden.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Households and the Environment Survey, 2009.

27. Canadian Lung Association, 2010, *Heating methods and open burning*, *www.lung.ca/protect-protegez/pollution-pollution/outdoor-exterior/heating-chauffage_e.php#open* (accessed July 21, 2011).

Canadian environment, economic and social indicators

Table 5
Population indicators

	2005	2006	2007	2008	2009	2010
Population [1]						
Persons	32,245,209	32,576,074	32,929,733	33,315,976	33,720,184	34,108,752
Percent change from previous year	1.0	1.0	1.1	1.2	1.2	1.2
Aged 65 and over (percent of total)	13.1	13.3	13.5	13.7	13.9	14.1
Density (per square kilometre)	3.6	3.6	3.7	3.7	3.7	3.8

1. Population data is based on the Estimates of Population program.

Source(s): Statistics Canada, CANSIM table 051-0001 (accessed August 17, 2011). Statistics Canada, 2007, *Population and Dwelling Count Highlight Tables, 2006 Census*, Catalogue no. 97-550-X2006002.

Table 6
Economy indicators

	2005	2006	2007	2008	2009	2010
Gross Domestic Product (GDP)						
GDP (millions of chained 2002 dollars)	1,247,807	1,283,033	1,311,260	1,320,291	1,283,722	1,324,993
Percent change from previous year	3.0	2.8	2.2	0.7	-2.8	3.2
Per capita (chained 2002 dollars)	38,697	39,386	39,820	39,629	38,070	38,846
Consumer Price Index (2002 = 100)	107.0	109.1	111.5	114.1	114.4	116.5
Unemployment rate (percent)	6.8	6.3	6.0	6.1	8.3	8.0

Source(s): Statistics Canada, CANSIM tables 380-0017, 051-0001, 326-0021 and 282-0002 (accessed September 9, 2011).

Table 7
Social indicators

	2005	2006	2007	2008	2009	2010
Average household spending [1]						
Total (current dollars)	65,575	67,736	69,946	71,364	71,117	..
Water and sewage (current dollars)	211	221	253	251	259	..
Electricity (current dollars)	1,070	1,111	1,147	1,162	1,183	..
Food (current dollars)	6,978	7,046	7,305	7,435	7,262	..
Gasoline and other motor fuels (current dollars)	2,024	2,079	2,223	2,233	2,218	..
Personal expenditure on consumer goods and services (millions of chained 2002 dollars)	723,146	753,263	787,765	811,157	814,215	841,466
Residential waste						
Production [2] (tonnes)	..	12,616,337	..	12,897,396	..	..
Production per capita (kilograms)	..	387	..	387	..	..
Disposal (tonnes)	..	8,893,494	..	8,536,891	..	..
Disposal per capita (kilograms)	..	273	..	256	..	..
Diversion (tonnes)	..	3,722,843	..	4,360,505	..	..
Diversion per capita (kilograms)	..	114	..	131	..	..
Diversion rate (percent of waste production)	..	30	..	34	..	..
Distance driven by light vehicles [3] (millions of kilometres)	289,717	296,871	300,203	294,361	303,576	..

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. The estimates presented in this table refer only to material entering the waste stream and do not cover any waste that may be managed on-site by a household. In addition, these data do not include materials that were processed for reuse and resale, (for example, whole sale of scrap metal or used clothing), nor those materials that are collected through deposit-return systems and therefore not processed at a material recovery facility.
3. 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 and 405-0063 (accessed September 9, 2011).

Table 8
Energy indicators

	2005	2006	2007	2008	2009	2010
Primary energy availability (terajoules)	11,307,113	11,176,879	11,969,050	11,179,124	10,962,914	..
Primary and secondary energy						
Exports (terajoules)	9,641,137	9,833,549	10,308,635	10,265,704	8,816,828	..
Residential consumption (terajoules)	1,296,644	1,243,425	1,336,452	1,356,259	1,316,207	..
Established reserve						
Crude bitumen (closing stock, [1] millions of cubic metres)	1,620	3,340	3,500	4,300	4,216	4,130
Crude oil (closing stock, [1] millions of cubic metres)	752.3	712.6	721.8	688.8	622.5	..
Natural gas (closing stock, [1] billions of cubic metres)	1,553.7	1,577.7	1,534.3	1,671.2	1,700.9	..
Recoverable reserves						
Coal (closing stock, [1] millions of tonnes)	4,560.4	4,468.8	4,395.2	4,322.0	4,347.1	..
Uranium (closing stock, [1] tonnes)	431,000	423,400	482,000	447,000	383,000	..
Electricity generation						
Total (megawatt hours)	597,810,875	585,097,531	603,572,420	601,278,688	577,500,520	566,744,122
Hydro-electric (percent of total)	60.1	60.0	60.6	62.0	62.8	61.3
Nuclear (percent of total)	14.5	15.8	14.6	14.7	14.8	15.0
Fossil fuel and other fuel combustion (percent of total)	25.4	24.2	24.8	23.3	22.4	23.7

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

Source(s): Statistics Canada, CANSIM tables 128-0009, 127-0001, 127-0002 (accessed September 9, 2011), 153-0012, 153-0013, 153-0014, 153-0017, 153-0018 and 153-0019 (accessed September 20, 2011).

Table 9
Environment and natural resources indicators

	2005	2006	2007	2008	2009	2010
Greenhouse gas (GHG) emissions (megatonnes of carbon dioxide equivalent (CO_2eq))	731	719	748	732	690	..
GHG emissions per capita (tonnes of CO_2eq)	22.7	22.1	22.7	22.0	20.5	..
GHG emissions by final demand						
Total household [1] (megatonnes of CO_2eq)	415	412	432	..	..	..
Total household per capita (tonnes of CO_2eq)	12.9	12.6	13.1	..	..	..
Direct household [2] (megatonnes of CO_2eq)	111	109	115	..	..	..
Indirect household [3] (megatonnes of CO_2eq)	305	303	317	..	..	..
Exports (megatonnes of CO_2eq)	275	263	271	..	..	..
Value of selected natural resources						
Land (millions of current dollars)	1,367,002	1,532,193	1,708,196	1,832,780	1,905,946	2,004,683
Timber (millions of current dollars)	283,572	265,747	245,187	232,562	191,317	170,892
Subsoil resource stocks (millions of current dollars)	805,811	931,530	944,379	1,551,785	747,185	987,342
Average farm pesticide expenditures (current dollars)	7,792	8,268	9,147	11,361	11,647	..
Air quality [4]						
Ozone (population weighted, parts per billion)	40	38	39	37	..	..
$PM_{2.5}$(population weighted, micrograms per cubic metre)	10	8	8	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. 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 051-0001, 153-0046, 002-0044 (accessed August 17, 2011) and 378-0005 (accessed September 20, 2011). Environment Canada, 2011, *National Inventory Report 1990-2009: Greenhouse Gas Sources and Sinks in Canada - Executive Summary*, Catalogue no. En81-4/1-2009E-PDF. Environment Canada, 2010, *Environmental Indicators - Air Quality Data*, *www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=B1385495-1#air1_en* (accessed August 17, 2011). Statistics Canada, Environment Accounts and Statistics Division, Material and Energy Flow Accounts.

Updates

New releases

Agricultural Water Survey, 2010

The Agricultural Water Survey report provides information on the volume of water used for irrigation by crop type, the area of irrigated land, irrigation method, sources of irrigation water, practices to conserve water and energy, and water treatment prior to irrigation.

Released September 19, 2011 (Statistics Canada Catalogue no. 16-402-X).

Human Activity and the Environment 2011: Economy and the environment

Human Activity and the Environment 2011: Economy and the environment presents information on the relationship between Canada's economy and the environment. Statistics on Canada's environment are first looked at from an international perspective and are then presented for the following main themes: natural wealth, natural resource stocks, flows of energy and materials and environmental protection efforts.

Released June 28, 2011 (Statistics Canada Catalogue no. *16-201-X*).

Human Activity and the Environment: Detailed Statistics, 2011

Human Activity and the Environment: Detailed Statistics is a collection of statistics focusing on human activities from an environmental perspective. The report is divided into 13 themes or sections, and includes 105 data tables and 8 maps.

Themes include physical geography, climate, ecosystems, protected areas, natural resources, population, households and the environment, economy, transportation, environmental protection expenditures, waste management, research and development and legislation.

Released June 28, 2011 (Statistics Canada Catalogue no. *16-201-S*).

CANSIM tables and updates

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

The following tables have been added to CANSIM:

CANSIM table 153-0099, Farm irrigation status and irrigated crop area, by province, every two years

CANSIM table 153-0100, Irrigation volume by month and province, every two years

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Symbols

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
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0s	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
*	significantly different from reference category ($p < 0.05$)

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