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Science Statistics

Scientific and Technological Activities of Provincial Governments and Provincial Research Organizations, 2006/2007 to 2010/2011

September 2012 Edition

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Note of appreciation

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User information

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
0	true zero or a value rounded to zero
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 ($p < 0.05$)

Additional symbols used in this publication:

A	excellent (0 to 4.9% coefficient of variation)
B	very good (5.0% to 9.9% coefficient of variation)
C	good (10.0% to 14.9% coefficient of variation)
D	acceptable (15.0% to 24.9% coefficient of variation)

This is the final release of "*Science Statistics: Scientific and Technological Activities of Provincial Governments and Provincial Research Organizations".* The survey has been discontinued as of September 2012.

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Highlights

For the reference period 2010/2011 science and technology (S&T) spending in the six surveyed provinces (Prince Edward Island, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia) was $1.9 billion. S&T is comprised of research and development (R&D) and related scientific activities (RSA). Detailed definitions can be found under *Data quality, concepts and methodology — Definitions, data sources, concepts and methods*.

S&T spending levels showed little change from 2009/2010 but were lower than the $2.1 billion reported in 2008/2009. It should be noted that the participating provinces are not identical in the three years, a complete list of provincial participants, by year, can be found under *Data quality, concepts and methodology — Definitions, data sources, concepts and methods*.

S&T expenditure objectives for 2010/2011 remained concentrated in the same four categories as 2009/2010: protection and improvement of human health; basic research; control and care of the environment; and social structures and relationships. Together these four objectives accounted for 64.2% of 2010/2011 S&T expenditures, compared to 59.2% in 2009/2010.

S&T spending by the six surveyed provincial governments in 2010/2011 continued to be concentrated in natural sciences and engineering at $1.5 billion or 78% of overall S&T spending.

The total research and development (R&D) expenditures of the provincial governments of Prince Edward Island, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia were $1.7 billion in 2010/2011.

Intramural R&D spending in 2010/2011 among the seven provincial governments totalled $325 million. In comparison, extramural R&D spending was $1.4 billion during the same period. Eighty-four percent, or $1.2 billion, of extramural R&D spending occurred in natural sciences and engineering. While both intramural and extramural R&D spending are lower than 2009/2010 ($387 million and $1.3 billion respectively), the proportion attributed to natural sciences remains virtually unchanged at 84%.

In 2010/2011 there were 2,546 full time equivalent (FTE) R&D personnel reported from the seven participating provinces (six surveyed and Quebec data files), down 3.2% from the previous year. Comparatively R&D FTEs were 2,630 in 2009/2010, a 2.7% decline, from 2008/2009. The majority of 2010/2011 R&D personnel were in the scientific and professional category (57%), up from 52% reported in 2009/2010. Eighty percent, or 2,044 R&D personnel worked in natural sciences and engineering, down from 83% reported in 2009/2010.

In 2010/2011 total expenditures on S&T activities by the seven Provincial Research Organizations (PRO) reached $156.5 million, an increase of 68.7% from the previous year.

Not all PROs report R&D expenditures. In 2010/2011, R&D expenditures were reported by the PROs located in New Brunswick, Quebec, Saskatchewan, Yukon, and the Northwest Territories. Collectively these PROs spent $38.2 million on R&D, compared to $35.5 million in the previous year, a 7% increase.

Analysis

This publication reports on scientific and technological (S&T) activities involving the generation, dissemination and application of new scientific and technological knowledge, for the provincial governments of: Newfoundland and Labrador, Prince Edward Island, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. A complete list of provincial participants can be found under *Data quality, concepts and methodology — Definitions, data sources, concepts and methods*.

For reference year 2010/2011, the following provinces supplied science and technology (S&T) expenditure data as survey respondents: Prince Edward Island, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. Data files provided by the province of Quebec include R&D expenditures only.

Note to readers

Data for Prince Edward Island are available, for the first time, in this data series for 2010/2011.

For New Brunswick, the spending intentions for 2009/2010 were collected in reference year 2008/2009.

Similarly for British Columbia, the spending intentions for 2008/2009 were collected in reference year 2007/2008 and in Newfoundland and Labrador; the spending intentions for 2007/2008 were collected in reference year 2006/2007.

Saskatchewan collected data as a limited pilot from seven ministries for reference year 2007/2008. For 2008/2009 the survey included 15 ministries. This difference in survey coverage contributes to the year-over-year change in expenditures and personnel.

Since 1994/1995, the Quebec provincial government has conducted and processed its own survey of R&D activities, and shared the results with Statistics Canada. Quebec is included in tables of R&D expenditures in this publication; however their data are not included in the tables of S&T expenditures, as data on RSA are not collected.

Statistics Canada obtained permission from respondents to the Scientific Activities of Provincial Research Organizations Survey to publish their information by name to support analysis.

In the subsequent analysis, results for provincial governments and provincial research organizations (PROs) are presented separately.

Scientific and technological (S&T) spending

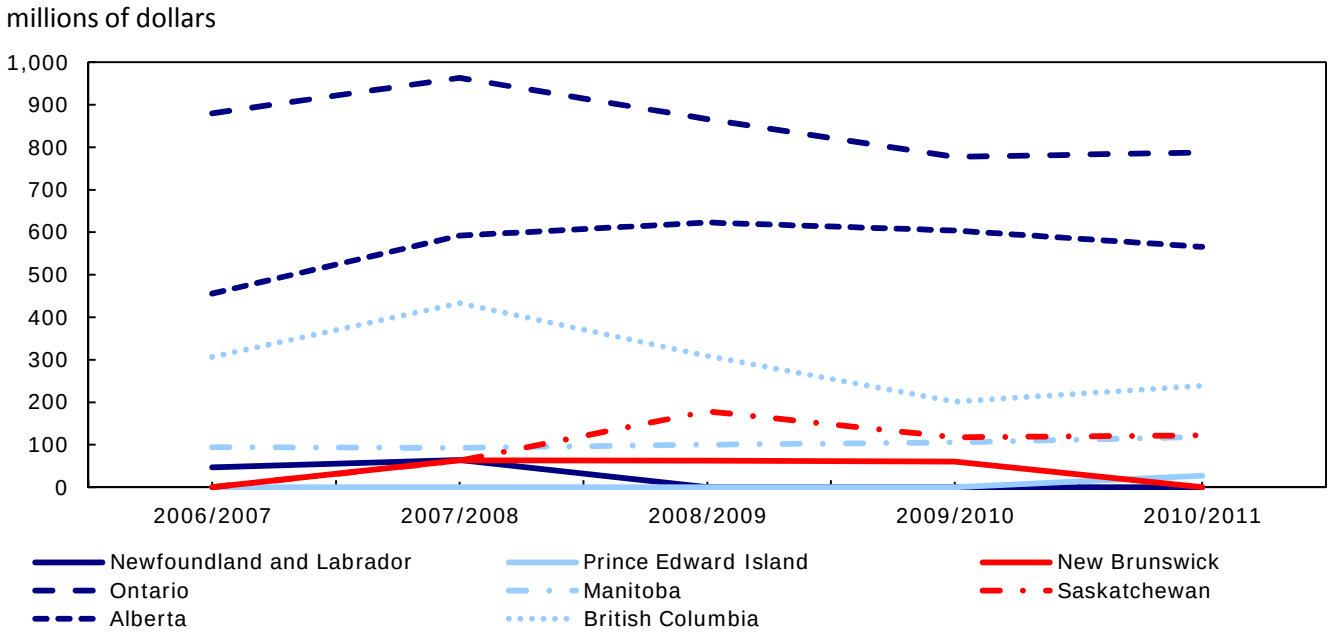
Among the six surveyed provinces for the reference period 2010/2011 (Prince Edward Island, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia) overall S&T spending was $1.9 billion. Ontario accounted for 42% of this overall S&T spending followed by Alberta at 30%. (Table 3-2).

Increases in S&T spending between 2009/2010 and 2010/2011 were reported in British Columbia (18.7%), Manitoba (12.6%), Saskatchewan (4.1%) and Ontario (1.3%) while Alberta reported a decrease of 6.3%. (Table 3-1).

The S&T spending increases in Ontario and British Columbia follow two years of spending decreases in 2008/2009 and 2009/2010; Manitoba's S&T spending has increased each year since 2007/2008. Saskatchewan's increase in 2010/2011 follows a 34.0% year over year decrease in S&T spending in 2009/2010 which largely reflected the completion of a onetime RSA capital expenditure that existed in 2008/2009. Alberta's S&T spending decreases in 2010/2011 and 2009/2010 followed two consecutive years of spending increases. (Table 3-1 and Chart 1).

Surveyed for the first time, Prince Edward Island reported the value of S&T spending at $26.8 million. Prince Edward Island had the greatest proportion of S&T intramural expenditures to total expenditures (58%) among surveyed provinces in 2010/2011, followed by Saskatchewan at 39% and Alberta and Manitoba, each with 38% (Table 3-2).

Chart 1
Total S&T expenditures of participating provinces



Note: Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

S&T spending by socio-economic objective

S&T expenditures are reported by thirteen socio-economic objectives:

1. Exploration and exploitation of the earth
2. Infrastructure and general planning of land use
3. Control and care of the environment
4. Protection and improvement of human health
5. Production, distribution and rational utilization of energy
6. Agriculture production and technology
7. Fishing
8. Forestry

9. Industrial production and technology

10. Social structures and relationships

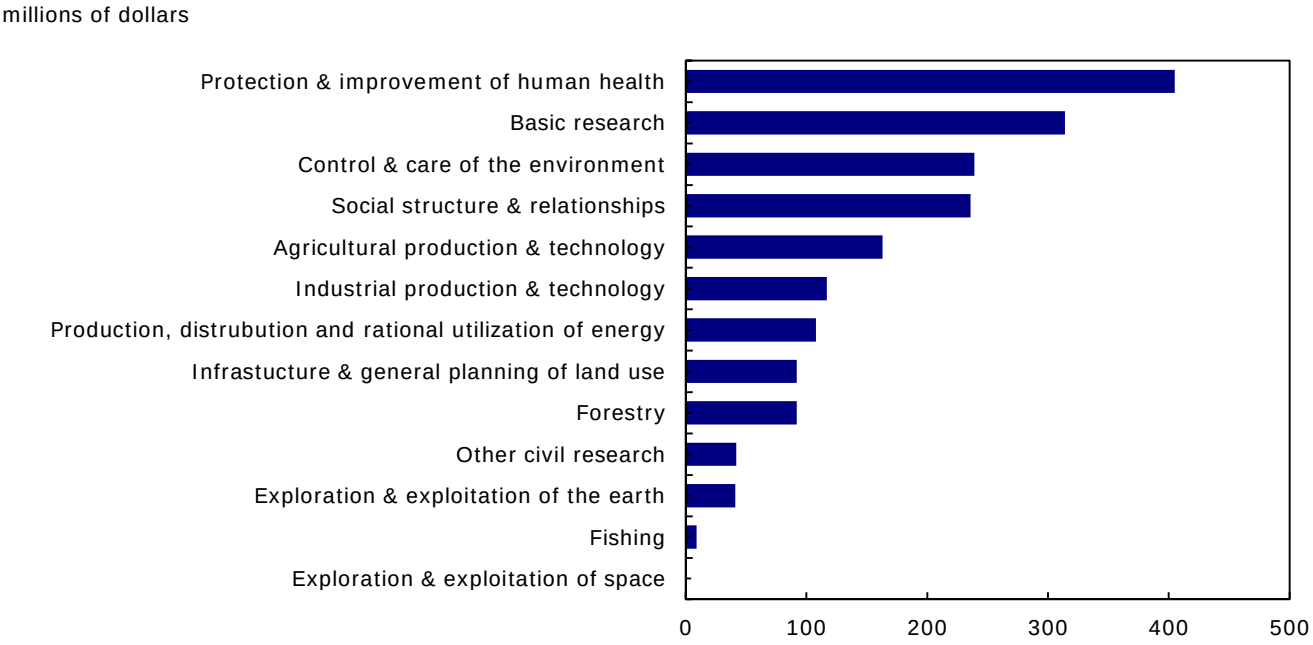
11. Exploration and exploitation of space

12. Basic research

13. Other civil research

In 2010/2011, total expenditures on S&T by the six surveyed provincial governments varied by socio-economic objective. The four objectives with the highest total S&T spending among the surveyed provinces in 2010/2011 were: protection and improvement of human health ($405.1 million or 22%); basic research ($313.6 million or 17%); control and care of the environment ($238.8 million or 13%); and social structures and relationships ($236.2 million or 13%) (Table 5).

Chart 2
Total S&T expenditures of participating provinces, by socio-economic objective, 2010/2011



Note: Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals. Examples of socio-economic objectives provided to survey respondents are listed in the *'Data quality, concepts and methodology*' section of this publication. For illustration purposes the socio-economic objectives are listed here in descending order.

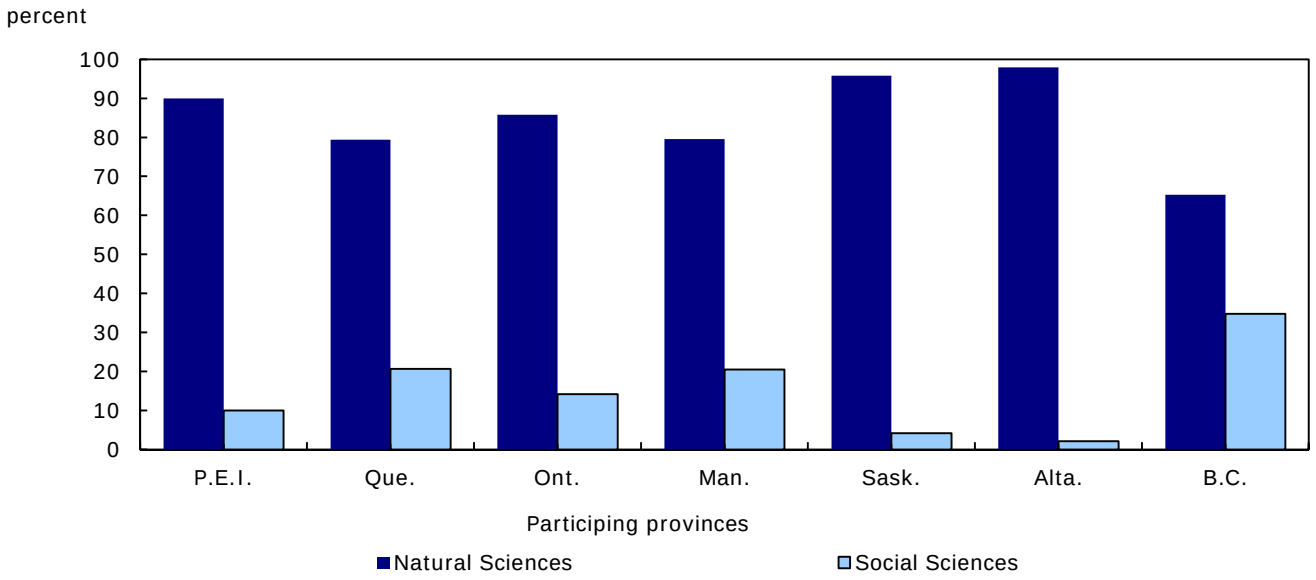
The largest proportions of 2010/2011 S&T spending on 'protection and improvement of human health' were by Prince Edward Island (33%), Alberta (23%) and Ontario (22%).'Social structures and relationships' saw the largest proportions of S&T spending in 2010/2011 by the provincial governments of Saskatchewan (29%) and Manitoba (28%). S&T spending was concentrated on 'basic research' in British Columbia (34%) (Table 5).

S&T spending by science type

This publication categorizes S&T spending by two science types: natural sciences and engineering; and social sciences and humanities. Natural sciences and engineering includes scientific activities related to natural, physical, medical, health and agricultural sciences, engineering and engineering technology. Social sciences includes fields such as economics, geography, law, political science, psychology and urban and rural planning and in the humanities includes fields such as history, communications and media studies.

S&T spending by the six surveyed provincial governments in 2010/2011 continued to be concentrated in natural sciences and engineering at $1.5 billion or 78% of overall S&T spending. (Table 3-5).

Chart 3
Percentage of R&D expenditures, by science type, by participating provinces, 2010/2011



Ontario accounted for $632.7 million, while Alberta's spending totalled $501.6 million which together, represented 78% of the surveyed provinces' 2010/2011 S&T expenditures in the natural sciences and engineering. (Table 3-5).

Alberta directed the largest proportion of its S&T spending to natural sciences and engineering at 89% followed by Ontario at 80% and Prince Edward Island at 77%. (Tables 3-1 and 3-5).

The remaining 22% ($400.7 million) of S&T spending by the six surveyed provincial governments in 2010/2011 was directed towards activities in the social sciences and humanities. Ontario accounted for 39% ($155.3 million) of S&T spending in the social sciences and humanities followed by British Columbia at 24% ($96.2 million) and Alberta at 16% ($64.2 million). (Table 3-9).

R&D spending

R&D expenditure data are available for six provinces (Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia) in both 2009/2010 and 2010/2011. R&D expenditure data for Prince Edward Island are available only for reference year 2010/2011.

The combined R&D expenditures of Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia increased by 1.2% to $1.7 billion in 2010/2011. The provinces with the largest R&D expenditures in 2010/2011 continued to be Quebec ($572.0 million), Ontario ($450.6 million) and Alberta ($380.7 million). British Columbia reported the greatest year over year change with a 49.5% increase over 2009/2010, after reporting a decrease of 49.3% between 2008/2009 and 2009/2010. The remaining five provinces reported individual year over year changes from 2009/2010 not exceeding ten percent (Table 3-1).

Intramural R&D spending

Intramural (in-house) R&D expenditures of the seven provincial governments (six surveyed provinces and Quebec data files) totalled $325 million in 2010/2011. Alberta reported the largest share of the total with $123.6 million (38%), followed by Quebec $94.9 million (29%) and Ontario $53.9 million (17%). (Table 3-2).

Within each of the seven provinces, Alberta had the highest proportion of its R&D spending as intramural at 32%; followed by Saskatchewan with 30%; Prince Edward Island 27%; Manitoba 23%; Quebec 17%; Ontario 12% and British Columbia at 11%. (Table 3-2).

Extramural R&D spending

Extramural R&D expenditures of the seven provincial governments totalled $1.4 billion in 2010/2011. Quebec reported the largest share of the total with $477.1 million (35%) followed by Ontario with $396.6 million (29%) and British Columbia with $145.8 million (11%). (Table 3-2).

Within each of the seven provinces, British Columbia had the highest proportion of its R&D spending as extramural (89%); followed by Ontario at 88%; Quebec at 83%; Manitoba 77%; Prince Edward Island 73%; Saskatchewan 70% and Alberta at 68%. (Table 3-2).

The extramural R&D spending of the seven provincial governments was directed mainly to the higher education sector $910.7 million, or 67% of the total, followed by hospitals and health organizations with $202.1 million or 15% of the total. (Table 3-2).

Extramural R&D spending by science type

Extramural R&D expenditures in the natural sciences and engineering by the seven provinces totalled $1.2 billion in 2010/2011. Quebec led the seven provinces in extramural R&D spending in the natural sciences and engineering with $387.4 million, followed by Ontario at $337.7 million and Alberta with $250.5 million. (Table 3-5).

All but one of the seven provinces directed the majority of their respective extramural R&D spending in natural sciences and engineering to the higher education sector. The exception, Prince Edward Island, directed the majority (78%) of their extramural R&D spending in natural sciences and engineering to the business enterprise sector (Table 3-5).

Quebec, Ontario and Alberta were the largest contributors to overall 2010/2011 extramural natural sciences and engineering R&D expenditures in the higher education sector. Quebec reported the largest share at $249.8 million (32%), followed by Ontario at $244.7 million (31%) and Alberta at $161.4 million (21%) (Table 3-5).

Extramural R&D expenditures in the social sciences and humanities by the seven provinces totalled $218.2 million in 2010/2011. Prince Edward Island, Quebec, Ontario and Manitoba directed the majority of their extramural funding to the higher education sector, while Alberta and British Columbia gave the greatest proportion of their provincial spending to hospitals and health organizations. Saskatchewan directed the nearly half (49%) of their provincial funding to the business enterprise sector. Quebec and Ontario were the largest contributors to overall 2010/2011 extramural social sciences and humanities R&D expenditures in the higher education sector. Quebec reported the largest share at $76.4 million (62%), followed by Ontario with $40.6 million (33%). (Table 3-9).

R&D personnel

Full time equivalent (FTE) R&D personnel in Prince Edward Island, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia totalled 2,546 in 2010/2011. Fifty-seven percent of these FTEs were in the scientific and professional category. (Table 12-2).

In 2010/2011, Quebec reported the largest number, 837 FTEs, engaged in R&D activities, including 511 (61%), scientists and professionals. Alberta reported 798 FTEs engaged in R&D activities, with 366 (46%) FTEs in the scientific and professional category. Ontario followed reporting 538 R&D FTEs including 338 (63%) scientists and professionals. (Table 12-2).

Within each of the seven provinces, British Columbia had the largest percentage of scientific and professional staff at 74% of their R&D personnel followed by Prince Edward Island at 64% (Table 12-2).

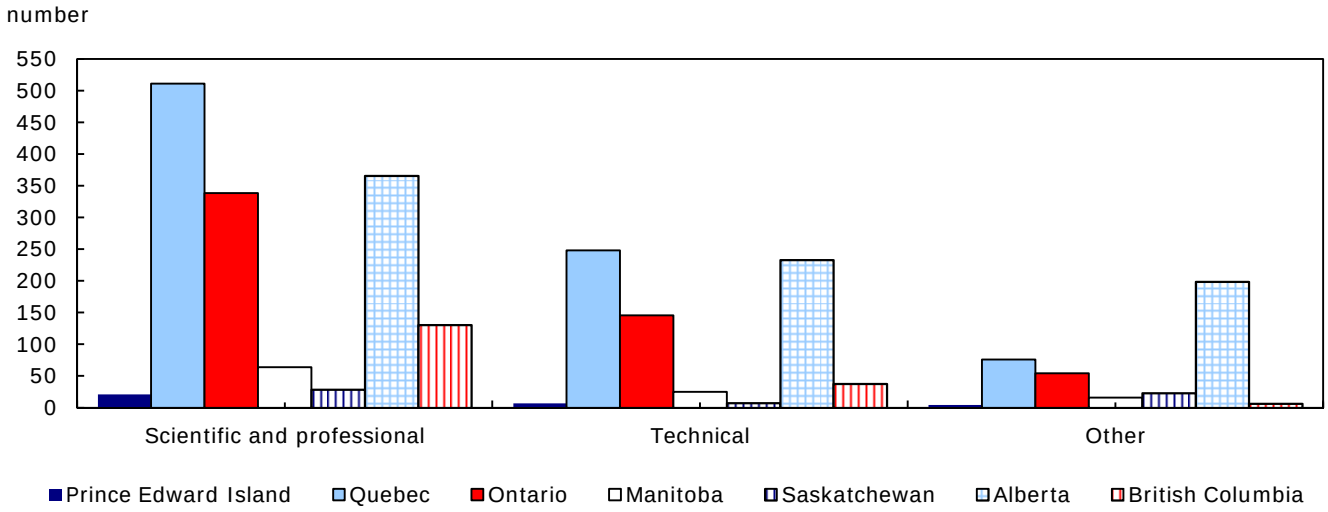
R&D personnel by science type

There were 2,045 R&D personnel FTEs in the natural sciences and engineering, in 2010/2011 representing 80% of total R&D personnel in the seven provinces. Scientific and professional personnel made up 1,067 of these FTEs or 73% of the total. (Table 12-4).

Alberta had the highest number of natural sciences and engineering R&D personnel reporting 781 FTEs, followed by Quebec at 513 and Ontario with 462. (Table 12-4).

Quebec reported the largest number of R&D personnel in the social sciences and humanities in 2010/2011 with 324 FTEs, followed by 76 in Ontario and 48 in Manitoba. (Table 12-6).

Chart 4
R&D personnel of participating provincial governments engaged in scientific activities, 2010/2011



Note: Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Provincial research organization (PRO) S&T spending

There are seven PROs in Canada which are surveyed, they are located in New Brunswick, Quebec, Manitoba, Saskatchewan, Yukon, Nunavut and the Northwest Territories. In 2010/2011 total expenditures on S&T activities by the seven PROs reached $156.5 million, an increase of 68.7% from the previous year. Seventy-seven percent of this increase can be attributed to the Nunavut Research Institute, which reported RSA expenditures for the first time. (Table 14).

PRO R&D spending

The PROs located in New Brunswick, Quebec, Saskatchewan, Yukon, and the Northwest Territories spent $38.2 million on R&D, compared to $35.5 million in the previous year, a 7.4% increase. Manitoba and Nunavut did not report R&D expenditures. This 7.4% increase reflects increased R&D spending in the PROs with the exception of Quebec. (Table 14).

The Saskatchewan Research Council accounted for the majority (55%) of the total R&D expenditures of PROs in 2010/2011 at $20.8 million up 2.5% from 2009/2010, followed by the Centre de recherche industrielle du Québec, with reported spending of $10.9 million down 1.7% from the previous year. (Table 14).

Related products

Selected publications from Statistics Canada

88-202-X	Industrial Research and Development: Intentions
88-204-X	Federal Scientific Activities
88-221-X	Gross Domestic Expenditures on Research and Development in Canada (GERD), and the Provinces
88-522-X	Science and Technology Activities and Impacts: A Framework for a Statistical Information
88F0006X	Business Special Surveys and Technology Statistics Division Working Papers

Selected CANSIM tables from Statistics Canada

358-0001	Gross domestic expenditures on research and development, by science type and by funder and performer sector, annual
358-0024	Business enterprise research and development (BERD) characteristics, by industry group based on the North American Industry Classification System (NAICS), annual
358-0026	Intellectual property management, by federal departments and agencies indicators, annual
358-0142	Federal expenditures on science and technology and its components in current dollars and 2002 constant dollars, annual
358-0143	Federal expenditures on science and technology and its components, by type of science and performing sector, annual
358-0144	Federal expenditures on science and technology and its components, by activity and performing sector, annual
358-0145	Federal intramural expenditures on science and technology and its components, by type of science for the National Capital Region, annual
358-0146	Federal personnel engaged in science and technology activities, by type of science and personnel category, annual
358-0147	Federal personnel engaged in science and technology and its components, by type of science and personnel category, annual
358-0148	Federal personnel engaged in science and technology and its components, by type of science, personnel category, Canada, provinces and territories, annual

358-0149	Federal expenditures on science and technology and its components, by type of science, performing sector, Canada, provinces and territories, annual
358-0150	Federal extramural expenditures on science and technology and its components, by type of science, performing sector, type of payment, Canada, provinces and territories, annual
358-0151	Federal expenditures on science and technology and its components, by socio-economic objectives, annual

Selected surveys from Statistics Canada

4201	Research and Development in Canadian Industry
4204	Research and Development of Canadian Private Non-Profit Organizations
4208	Provincial Research Organizations
4212	Federal Science Expenditures and Personnel, Activities in the Social Sciences and Natural Sciences
5109	Higher Education Research and Development Estimates

Selected summary tables from Statistics Canada

- *Domestic spending on research and development (GERD), performing sector, by province*
- *Domestic spending on research and development (GERD)*
- *Research and development performed by the business enterprise sector*
- *Domestic spending on research and development (GERD), funding sector, by province*

Statistical tables

Table 1
Provincial indicators, 2009

	Population [1]	Provincial Gross Domestic Product [2]	Gross Domestic Expenditures on Research and Development [3]	Gross Domestic Expenditures on Research and Development over Provincial Gross Domestic Product [3]	Gross Domestic Expenditures on Research and Development over Capita
	thousands	millions of dollars		ratio	dollars
Canada [4]	**33,857**	**1,528,985**	**29,430**	**1.92**	**869**
Newfoundland and Labrador	511	24,762	259	1.05	507
Prince Edward Island	142	4,778	66	1.38	465
Nova Scotia	943	34,774	500	1.44	530
New Brunswick	751	27,920	327	1.17	435
Quebec [5]	7,852	304,861	7,855	2.58	1,000
Ontario [5]	13,124	581,635	13,386	2.30	1,020
Manitoba	1,223	51,518	653	1.27	534
Saskatchewan	1,034	57,995	596	1.03	576
Alberta	3,685	240,697	2,851	1.18	774
British Columbia	4,484	191,863	2,798	1.46	624

1. CANSIM table 051-0005
2. CANSIM table 384-0002
3. Gross domestic expenditures on research and development in Canada and the provinces (GERD), national estimates 2001 to 2011, provincial estimates 2005 to 2009.
4. Includes the Yukon, Northwest Territories and Nunavut.
5. Quebec and Ontario Gross Domestic Expenditures on Research and Development figures now include federal government expenditures in the National Capital Region.

Note(s): Components may not add to total due to rounding.
Source(s): CANSIM tables 051-0005 and 384-0002.

Table 2
Provincial distribution of gross expenditures on research and development by performing and funding sectors, 2009

	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia	Total Canada [1]
	millions of dollars										
Performing Sector											
Total	**259**	**66**	**500**	**327**	**7,855**	**13,386**	**653**	**596**	**2,851**	**2,798**	**29,430**
Federal government	25	15	67	37	396	1,811	112	72	108	115	**2,762**
Provincial governments [2]	0	0	0	13	99	51	8	84	138	25	**420**
Business enterprise	81	9	89	119	4,581	6,971	204	129	1,420	1,502	**15,110**
Higher Education	153	41	345	158	2,779	4,555	328	311	1,185	1,157	**11,013**
Private non-profit organizations	..	..	..	..	..	..	..	..	..	..	**125**
Funding Sector											
Total	**259**	**66**	**500**	**327**	**7,855**	**13,386**	**653**	**596**	**2,851**	**2,798**	**29,430**
Federal government	66	30	164	84	1,240	3,040	194	175	375	514	**5,915**
Provincial governments [2]	5	1	10	18	423	448	33	110	344	154	**1,591**
Business enterprise	87	9	109	125	4,147	6,132	202	138	1,449	1,288	**13,694**
Higher Education	86	24	186	96	1,277	2,130	165	152	508	498	**5,121**
Private non-profit organizations	5	1	22	2	239	406	33	14	86	105	**954**
Foreign	11	0	9	3	531	1,231	27	7	89	240	**2,156**

1. Includes Yukon, Northwest Territories and Nunavut.
2. Includes provincial research organizations.

Note(s): Quebec and Ontario figures now include federal government expenditures on research and development performed in the National Capital Region. The private non-profit (PNP) sector appears in both the performing and funding sector for the gross domestic expenditure on research and development (GERD) for Canada. Commencing with reference year 2000 the data for the PNP sector performing research and development are not distributed by provinces or territories. The national totals of research and development by performing sector include the PNP sector. The data for the PNP sector funding research and development continue to be distributed by provinces and territories. Components may not add to total due to rounding.

Table 3-1
Total expenditures of participating provincial governments on scientific activities — By activity

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Science and technology					
Newfoundland and Labrador	46,548	64,173 E	..	..	..
Prince Edward Island	..	..	..	..	26,815
New Brunswick	..	63,158	62,516	60,179 E	..
Ontario	879,992	963,420	866,553	777,552	787,972
Manitoba	94,542	92,609	100,228	105,230	118,528
Saskatchewan 1	..	62,751 E	178,176	117,546	122,360
Alberta	455,926	592,173	622,652	603,951	565,811
British Columbia	306,369	432,896	308,999 E	201,233	238,837
Research and development					
Newfoundland and Labrador	7,474	9,284 E	..	..	..
Prince Edward Island	..	..	..	..	9,741
New Brunswick	..	27,181	28,246	29,017 E	..
Quebec 2	456,001	504,444	512,038	580,420	572,043
Ontario	548,865	595,272	514,167	428,964	450,558
Manitoba	29,902	30,578	36,040	39,830	43,813
Saskatchewan 1	..	47,578 E	66,795	72,379	72,008
Alberta	318,022	374,913	407,340	413,148	380,658
British Columbia	144,525	316,329	216,762 E	109,939	164,344
Related scientific activities					
Newfoundland and Labrador	39,074	54,889 E	..	..	..
Prince Edward Island	..	..	..	..	17,074
New Brunswick	..	35,977	34,270	31,162 E	..
Ontario	331,127	368,148	352,386	348,588	337,414
Manitoba	64,640	62,031	64,188	65,400	74,715
Saskatchewan 1	..	15,173 E	111,381	45,167	50,352
Alberta	137,904	217,260	215,312	190,803	185,153
British Columbia	161,844	116,567	92,237 E	91,294	74,493

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-2
Total expenditures of participating provincial governments on scientific activities — By activity, and by sector of performance, 2010/2011

	Intramural	Business enterprise	Higher education	Hospitals and health organizations	Provincial research organizations	Other	Total
	thousands of dollars						
Science and technology							
Prince Edward Island	15,507	5,832	2,401	1,085	...	1,990	**26,815**
Ontario	221,131	67,188	329,868	103,723	...	66,062	**787,972**
Manitoba	44,881	30,743	25,386	2,832	800	13,886	**118,528**
Saskatchewan	47,928	12,526	40,427	2,089	1,952	17,438	**122,360**
Alberta	215,103	102,827	174,130	40,920	...	32,831	**565,811**
British Columbia	49,866	21,878	85,326	63,069	...	18,698	**238,837**
Research and development							
Prince Edward Island	2,648	5,354	1,237	10	...	492	**9,741**
Quebec [1]	94,923	40,667	326,129	39,262	0	71,062	**572,043**
Ontario	53,931	15,747	285,337	75,403	...	20,140	**450,558**
Manitoba	9,981	6,374	23,658	2,832	800	168	**43,813**
Saskatchewan	21,714	4,713	34,927	0	1,115	9,539	**72,008**
Alberta	123,553	52,590	164,020	28,591	...	11,904	**380,658**
British Columbia	18,510	13,291	75,394	56,000	...	1,149	**164,344**
Related scientific activities							
Prince Edward Island	12,859	478	1,164	1,075	...	1,498	**17,074**
Ontario	167,200	51,441	44,531	28,320	...	45,922	**337,414**
Manitoba	34,900	24,369	1,728	0	0	13,718	**74,715**
Saskatchewan	26,214	7,813	5,500	2,089	837	7,899	**50,352**
Alberta	91,550	50,237	10,110	12,329	...	20,927	**185,153**
British Columbia	31,356	8,587	9,932	7,069	...	17,549	**74,493**

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-3
Total expenditures of participating provincial governments on scientific activities — In the natural sciences and engineering, by activity

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Science and technology					
Newfoundland and Labrador	10,532	14,050 E	..	..	..
Prince Edward Island	..	..	..	..	20,766
New Brunswick	..	40,138	37,566	34,929 E	..
Ontario	699,765	798,627	682,284	617,253	632,711
Manitoba	66,222	65,988	66,087	75,589	77,519
Saskatchewan 1	..	41,367 E	123,559	83,786	84,449
Alberta	424,710	508,739	553,266	540,052	501,572
British Columbia	199,399	317,905	194,579 E	157,443	142,651
Research and development					
Newfoundland and Labrador	6,724	8,821 E	..	..	..
Prince Edward Island	..	..	..	..	9,227
New Brunswick	..	19,041	17,892	15,622 E	..
Quebec 2	340,283	376,221	390,717	439,762	453,641
Ontario	464,544	531,956	445,357	366,463	386,614
Manitoba	26,315	26,321	25,901	29,645	34,880
Saskatchewan 1	..	34,831 E	52,077	69,786	68,578
Alberta	307,283	360,136	392,339	407,383	372,846
British Columbia	84,125	223,524	125,037 E	92,599	107,029
Related scientific activities					
Newfoundland and Labrador	3,808	5,229 E	..	..	..
Prince Edward Island	..	..	..	..	11,539
New Brunswick	..	21,097	19,674	19,307 E	..
Ontario	235,221	266,671	236,927	250,790	246,097
Manitoba	39,907	39,667	40,186	45,944	42,639
Saskatchewan 1	..	6,536 E	71,482	14,000	15,871
Alberta	117,427	148,603	160,927	132,669	128,726
British Columbia	115,274	94,381	69,542 E	64,844	35,622

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-4

Total expenditures of participating provincial governments on scientific activities — In the natural sciences and engineering, by activity, 2010/2011

	Prince Edward Island	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars						
Total science and technology	**20,766**	**..**	**632,711**	**77,519**	**84,449**	**501,572**	**142,651**
Total research and development	**9,227**	**453,641**	**386,614**	**34,880**	**68,578**	**372,846**	**107,029**
Current expenditures							
In-house	2,003	43,976	40,248	4,557	16,935	43,469	16,801
Contracts	745	7,153	54,166	33	25,948	107,613	11,795
Grants	5,675	330,470	265,952	27,664	23,624	173,830	77,904
Research fellowships	415	50,434	18,310	1,558	15	23,163	0
Administration of extramural research and development programs	334	14,793	7,326	1,064	2,056	21,899	529
Sub-total	9,172	446,825	386,002	34,876	68,578	369,974	107,029
Capital expenditures	55	6,816	612	4	0	2,872	0
Total related scientific activities	**11,539**	**..**	**246,097**	**42,639**	**15,871**	**128,726**	**35,622**
Current expenditures							
Education support	4,811	..	11,493	68	96	671	2,380
Technical surveys	3,207	..	91,374	13,097	1,888	57,695	7,120
Information services	1,976	..	34,556	0	2,477	22,012	5,073
Special services and studies	1,469	..	55,088	29,338	6,989	40,747	18,729
Museum services	0	..	43,363	0	4,292	2,454	1,136
Administration of extramural related scientific activities programs	76	..	6,427	136	129	3,243	1,184
Sub-total	11,539	..	242,301	42,639	15,871	126,822	35,622
Capital expenditures	0	..	3,796	0	0	1,904	0

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-5
Total expenditures of participating provincial governments on scientific activities — In natural sciences and engineering, by activity and sector of performance, 2010/2011

	Intramural	Business enterprise	Higher education	Hospitals and health organizations	Provincial research organizations	Other	Total
	thousands of dollars						
Science and technology							
Prince Edward Island	10,136	5,755	1,925	1,056	...	1,894	**20,766**
Ontario	177,795	50,306	280,495	74,344	...	49,771	**632,711**
Manitoba	27,262	23,671	21,659	2,832	715	1,380	**77,519**
Saskatchewan	32,042	5,064	34,923	0	1,862	10,558	**84,449**
Alberta	186,542	99,035	165,503	31,082	0	19,410	**501,572**
British Columbia	31,779	21,256	81,417	0	...	8,199	**142,651**
Research and development							
Prince Edward Island	2,392	5,354	989	0	...	492	**9,227**
Quebec [1]	66,198	39,142	249,773	37,452	0	61,077	**453,641**
Ontario	48,954	14,514	244,717	67,256	...	11,173	**386,614**
Manitoba	5,687	4,997	20,567	2,832	715	82	**34,880**
Saskatchewan	20,281	3,743	34,527	0	1,115	8,912	**68,578**
Alberta	122,311	52,399	161,391	24,841	0	11,904	**372,846**
British Columbia	17,330	13,226	75,364	0	...	1,109	**107,029**
Related scientific activities							
Prince Edward Island	7,744	401	936	1,056	...	1,402	**11,539**
Ontario	128,841	35,792	35,778	7,088	...	38,598	**246,097**
Manitoba	21,575	18,674	1,092	0	0	1,298	**42,639**
Saskatchewan	11,761	1,321	396	0	747	1,646	**15,871**
Alberta	64,231	46,636	4,112	6,241	0	7,506	**128,726**
British Columbia	14,449	8,030	6,053	0	...	7,090	**35,622**

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-6
Total expenditures of participating provincial governments on scientific activities — In natural sciences and engineering, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**20,766**	**632,711**	**77,519**	**84,449**	**501,572**	**142,651**
Exploration and exploitation of the earth	0	21,341	5,612	901	10,118	3,136
Infrastructure and general planning of land use	0	22,163	26,395	21,459	17,865	1,296
Control and care of the environment	1,472	119,954	8,621	9,510	80,089	14,542
Protection and improvement of human health	8,378	127,844	9,833	393	115,157	3
Production, distribution and rational utilization of energy	611	17,489	2,038	4,498	70,518	12,892
Agriculture production and technology	3,012	66,198	6,496	24,195	54,051	7,843
Fishing	1,747	6,823	0	0	404	369
Forestry	405	32,973	3,054	1,074	35,838	18,697
Industrial production and technology	3,149	48,462	5,783	63	52,138	4,409
Social structures and relationships	1,554	47,667	140	4,317	2,784	0
Exploration and exploitation of space	0	1,372	40	0	0	0
Basic research	438	110,005	8,372	17,352	62,610	77,075
Other civil research	0	10,420	1,135	687	0	2,389

Note(s): Components may not add to total due to rounding.

Table 3-7
Total expenditures of participating provincial governments on scientific activities — In the social sciences and humanities, by activity

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Science and technology					
Newfoundland and Labrador	36,016	50,123 E	..	..	..
Prince Edward Island	..	..	..	..	6,049
New Brunswick	..	23,020	24,950	25,250 E	..
Ontario	180,227	164,793	184,269	160,299	155,261
Manitoba	28,320	26,621	34,141	29,641	41,009
Saskatchewan 1	..	21,384 E	54,617	33,760	37,911
Alberta	31,216	83,434	69,386	63,899	64,239
British Columbia	106,970	114,991	114,420 E	43,790	96,186
Research and development					
Newfoundland and Labrador	750	463 E	..	..	..
Prince Edward Island	..	..	..	..	514
New Brunswick	..	8,140	10,354	13,395 E	..
Quebec 2	115,718	128,223	121,321	140,658	118,401
Ontario	84,321	63,316	68,810	62,501	63,944
Manitoba	3,587	4,257	10,139	10,185	8,933
Saskatchewan 1	..	12,747 E	14,718	2,593	3,430
Alberta	10,739	14,777	15,001	5,765	7,812
British Columbia	60,400	92,805	91,725 E	17,340	57,315
Related scientific activities					
Newfoundland and Labrador	35,266	49,660 E	..	..	..
Prince Edward Island	..	..	..	..	5,535
New Brunswick	..	14,880	14,596	11,855 E	..
Ontario	95,906	101,477	115,459	97,798	91,317
Manitoba	24,733	22,364	24,002	19,456	32,076
Saskatchewan 1	..	8,637 E	39,899	31,167	34,481
Alberta	20,477	68,657	54,385	58,134	56,427
British Columbia	46,570	22,186	22,695 E	26,450	38,871

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-8

Total expenditures of participating provincial governments on scientific activities — In the social sciences and humanities, by activity, 2010/2011

	Prince Edward Island	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars						
Total science and technology	**6,049**	**..**	**155,261**	**41,009**	**37,911**	**64,239**	**96,186**
Total research and development	**514**	**118,401**	**63,944**	**8,933**	**3,430**	**7,812**	**57,315**
Current expenditures							
In-house	238	21,784	3,769	3,538	1,336	338	1,179
Contracts	258	3,968	7,625	680	1,702	191	35
Grants	0	68,448	38,400	4,290	200	6,379	56,100
Research fellowships	0	18,093	12,942	317	150	0	0
Administration of extramural research and development programs	18	5,548	1,192	108	42	904	1
Sub-total	514	117,841	63,928	8,933	3,430	7,812	57,315
Capital expenditures	0	560	16	0	0	0	0
Total related scientific activities	**5,535**	**..**	**91,317**	**32,076**	**34,481**	**56,427**	**38,871**
Current expenditures	5,415	..	85,729	31,778	33,841	52,953	37,982
Administration of extramural related scientific activities programs	114	..	979	298	580	3,444	889
Sub-total	5,529	..	86,708	32,076	34,421	56,397	38,871
Capital expenditures	6	..	4,609	0	60	30	0

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-9

Total expenditures of participating provincial governments on scientific activities — In the social sciences and humanities, by activity and by sector of performance, 2010/2011

	Intramural	Business enterprise	Higher education	Hospitals and health organizations	Provincial research organizations	Other	Total
	thousands of dollars						
Science and technology							
Prince Edward Island	5,371	77	476	29	...	96	**6,049**
Ontario	43,336	16,882	49,373	29,379	...	16,291	**155,261**
Manitoba	17,619	7,072	3,727	0	85	12,506	**41,009**
Saskatchewan	15,886	7,462	5,504	2,089	90	6,880	**37,911**
Alberta	28,561	3,792	8,627	9,838	0	13,421	**64,239**
British Columbia	18,087	622	3,909	63,069	...	10,499	**96,186**
Research and development							
Prince Edward Island	256	0	248	10	...	0	**514**
Quebec [1]	28,725	1,525	76,356	1,810	0	9,985	**118,401**
Ontario	4,977	1,233	40,620	8,147	...	8,967	**63,944**
Manitoba	4,294	1,377	3,091	0	85	86	**8,933**
Saskatchewan	1,433	970	400	0	0	627	**3,430**
Alberta	1,242	191	2,629	3,750	0	0	**7,812**
British Columbia	1,180	65	30	56,000	...	40	**57,315**
Related scientific activities							
Prince Edward Island	5,115	77	228	19	...	96	**5,535**
Ontario	38,359	15,649	8,753	21,232	...	7,324	**91,317**
Manitoba	13,325	5,695	636	0	0	12,420	**32,076**
Saskatchewan	14,453	6,492	5,104	2,089	90	6,253	**34,481**
Alberta	27,319	3,601	5,998	6,088	0	13,421	**56,427**
British Columbia	16,907	557	3,879	7,069	...	10,459	**38,871**

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Components may not add to total due to rounding.

Table 3-10

Total expenditures of participating provincial governments on scientific activities — In the social sciences and humanities, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**6,049**	**155,261**	**41,009**	**37,911**	**64,239**	**96,186**
Exploration and exploitation of the earth	0	0	0	0	0	0
Infrastructure and general planning of land use	0	3,279	0	40	0	0
Control and care of the environment	0	89	1,035	0	3,468	0
Protection and improvement of human health	541	48,508	3,254	6,936	15,011	69,243
Production, distribution and rational utilization of energy	0	77	138	0	0	0
Agriculture production and technology	0	686	325	0	0	0
Fishing	0	95	0	0	0	0
Forestry	0	175	67	0	0	0
Industrial production and technology	0	737	2,187	0	0	0
Social structures and relationships	5,508	46,983	33,034	30,811	44,904	18,542
Exploration and exploitation of space	0	0	30	0	0	0
Basic research	0	32,342	857	124	0	4,450
Other civil research	0	22,290	82	0	856	3,951

Note(s): Components may not add to total due to rounding.

Table 4-1

Total expenditures of participating provincial governments on research and development — In the natural sciences and engineering, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**9,227**	**386,614**	**34,880**	**68,578**	**372,846**	**107,029**
Exploration and exploitation of the earth	0	1,129	18	385	1,818	3,136
Infrastructure and general planning of land use	0	9,746	5,514	20,108	2,559	496
Control and care of the environment	147	43,295	2,696	4,285	34,760	7,353
Protection and improvement of human health	2,083	111,470	9,828	10	103,521	0
Production, distribution and rational utilization of energy	611	12,032	1,498	3,374	66,654	0
Agriculture production and technology	1,590	45,318	3,379	22,668	38,683	356
Fishing	1,307	862	0	0	0	369
Forestry	0	14,537	439	42	14,212	17,794
Industrial production and technology	3,149	37,159	1,921	0	49,038	2,029
Social structures and relationships	330	1,448	140	0	0	0
Exploration and exploitation of space	0	1,372	0	0	0	0
Basic research	10	107,859	8,312	17,286	61,601	75,496
Other civil research	0	387	1,135	420	0	0

Note(s): Components may not add to total due to rounding.

Table 4-2

Total expenditures of participating provincial governments on research and development — In the social sciences and humanities, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**514**	**63,944**	**8,933**	**3,430**	**7,812**	**57,315**
Exploration and exploitation of the earth	0	0	0	0	0	0
Infrastructure and general planning of land use	0	581	0	0	0	0
Control and care of the environment	0	0	1,000	0	0	0
Protection and improvement of human health	59	24,327	2,967	1,144	6,438	56,345
Production, distribution and rational utilization of energy	0	0	0	0	0	0
Agriculture production and technology	0	0	25	0	0	0
Fishing	0	80	0	0	0	0
Forestry	0	160	0	0	0	0
Industrial production and technology	0	50	1,377	0	0	0
Social structures and relationships	455	7,927	2,717	2,162	1,374	970
Exploration and exploitation of space	0	0	0	0	0	0
Basic research	0	29,729	847	124	0	0
Other civil research	0	1,090	0	0	0	0

Note(s): Components may not add to total due to rounding.

Table 5

Total expenditures of participating provincial governments on scientific activities, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**26,815**	**787,972**	**118,528**	**122,360**	**565,811**	**238,837**
Exploration and exploitation of the earth	0	21,341	5,612	901	10,118	3,136
Infrastructure and general planning of land use	0	25,442	26,395	21,499	17,865	1,296
Control and care of the environment	1,472	120,043	9,656	9,510	83,557	14,542
Protection and improvement of human health	8,919	176,352	13,087	7,329	130,168	69,246
Production, distribution and rational utilization of energy	611	17,566	2,176	4,498	70,518	12,892
Agriculture production and technology	3,012	66,884	6,821	24,195	54,051	7,843
Fishing	1,747	6,918	0	0	404	369
Forestry	405	33,148	3,121	1,074	35,838	18,697
Industrial production and technology	3,149	49,199	7,970	63	52,138	4,409
Social structures and relationships	7,062	94,650	33,174	35,128	47,688	18,542
Exploration and exploitation of space	0	1,372	70	0	0	0
Basic research	438	142,347	9,229	17,476	62,610	81,525
Other civil research	0	32,710	1,217	687	856	6,340

Note(s): Components may not add to total due to rounding.

Table 6
Total expenditures of participating provincial governments on research and development, by objective, 2010/2011

	Prince Edward Island	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	thousands of dollars					
Total	**9,741**	**450,558**	**43,813**	**72,008**	**380,658**	**164,344**
Exploration and exploitation of the earth	0	1,129	18	385	1,818	3,136
Infrastructure and general planning of land use	0	10,327	5,514	20,108	2,559	496
Control and care of the environment	147	43,295	3,696	4,285	34,760	7,353
Protection and improvement of human health	2,142	135,797	12,795	1,154	109,959	56,345
Production, distribution and rational utilization of energy	611	12,032	1,498	3,374	66,654	0
Agriculture production and technology	1,590	45,318	3,404	22,668	38,683	356
Fishing	1,307	942	0	0	0	369
Forestry	0	14,697	439	42	14,212	17,794
Industrial production and technology	3,149	37,209	3,298	0	49,038	2,029
Social structures and relationships	785	9,375	2,857	2,162	1,374	970
Exploration and exploitation of space	0	1,372	0	0	0	0
Basic research	10	137,588	9,159	17,410	61,601	75,496
Other civil research	0	1,477	1,135	420	0	0

Note(s): Components may not add to total due to rounding.

Table 7-1
Intramural expenditures of participating provincial governments on scientific activities — In the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	6,704	8,279 E	..	..	..
Prince Edward Island	..	..	..	..	10,136
New Brunswick	..	21,142	22,368	21,249 E	..
Ontario	196,258	193,926	187,336	166,511	177,795
Manitoba	29,019	29,497	29,537	30,336	27,262
Saskatchewan [1]	..	9,807 E	12,868	40,462	32,042
Alberta	203,564	215,319	235,949	206,345	186,542
British Columbia	84,065	105,268	95,216 E	81,279	31,779

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 7-2
Intramural expenditures of participating provincial governments on scientific activities — In the social sciences and humanities

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	15,899	18,922 E	..	..	..
Prince Edward Island	..	..	..	..	5,371
New Brunswick	..	10,991	14,186	13,146 E	..
Ontario	48,391	54,145	62,290	58,789	43,336
Manitoba	24,689	21,557	26,620	17,659	17,619
Saskatchewan [1]	..	4,797 E	12,857	15,205	15,886
Alberta	8,275	27,321	31,181	30,334	28,561
British Columbia	20,544	13,765	16,339 E	17,479	18,087

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 8
Intramural expenditures of participating provincial governments on research and development - in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	3,693	4,394 E	..	..	..
Prince Edward Island	..	..	..	..	2,392
New Brunswick	..	8,058	8,548	7,378 E	..
Quebec	54,153	59,255	66,357	65,632	66,198
Ontario	65,672	51,899	55,995	45,564	48,954
Manitoba	4,915	4,506	4,185	5,768	5,687
Saskatchewan 1	..	4,672 E	4,130	29,796	20,281
Alberta	123,970	138,568	150,373	136,522	122,311
British Columbia	15,200	29,635	32,481 E	23,826	17,330

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 9-1
Payments to business enterprises by participating provincial governments — On scientific activities in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
	thousands of dollars				
Newfoundland and Labrador	3,005	4,645 E	..	..	..
Prince Edward Island	..	..	..	..	5,755
New Brunswick	..	13,422	10,040	9,654 E	..
Ontario	18,147	41,530	52,117	64,047	50,306
Manitoba	14,371	13,741	15,789	24,578	23,671
Saskatchewan 1	..	4,851 E	10,597	5,634	5,064
Alberta	51,080	118,663	125,879	103,894	99,035
British Columbia	19,096	53,113	6,833 E	16,578	21,256

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 9-2
Payments to business enterprises by participating provincial governments — On research and development in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	2,591	3,570 E	..	..	..
Prince Edward Island	..	..	..	..	5,354
New Brunswick	..	8,850	7,046	6,658 E	..
Quebec	33,742	45,456	46,054	56,970	39,142
Ontario	891	12,900	12,514	14,998	14,514
Manitoba	996	218	2,081	3,908	4,997
Saskatchewan 1	..	4,089 E	9,608	4,308	3,743
Alberta	21,808	62,545	66,186	58,827	52,399
British Columbia	14,202	45,615	4,568 E	13,306	13,226

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 10-1

Payments to the higher education sector, by participating provincial governments — On scientific activities in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
	thousands of dollars				
Newfoundland and Labrador	773	761 E	..	..	..
Prince Edward Island	..	..	..	..	1,925
New Brunswick	..	2,450	2,103	1,520 E	..
Ontario	293,156	334,491	218,991	272,170	280,495
Manitoba	15,857	14,912	14,965	14,681	21,659
Saskatchewan [1]	..	24,094 E	92,911	21,957	34,923
Alberta	125,180	130,046	149,313	183,970	165,503
British Columbia	47,290	79,299	70,023 E	51,416	81,417

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 10-2

Payments to the higher education sector, by participating provincial governments — On research and development in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	390	492 E	..	..	..
Prince Edward Island	..	..	..	..	989
New Brunswick	..	575	459	116 E	..
Quebec	226,026	246,683	258,943	247,158	249,773
Ontario	262,584	302,968	207,658	245,636	244,717
Manitoba	14,490	14,882	14,945	14,172	20,567
Saskatchewan [1]	..	23,854 E	31,459	21,909	34,527
Alberta	123,922	129,395	148,469	181,107	161,391
British Columbia	39,044	77,855	68,262 E	49,198	75,364

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Table 11-1

Payments to other performers, by participating provincial governments — On scientific activities in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
	thousands of dollars				
Newfoundland and Labrador	50	365 E	..	..	..
Prince Edward Island	..	..	..	..	1,894
New Brunswick	..	2,010	1,538	1,038 E	..
Ontario	88,244	78,020	94,817	56,366	49,771
Manitoba	3,291	3,328	2,413	488	1,380
Saskatchewan [1]	..	2,135 E	7,080	10,552	10,558
Alberta	27,344	26,530	24,263	31,000	19,410
British Columbia	48,948	80,225	7,507 E	8,170	8,199

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Note(s): Other performers include the federal government, municipal governments, individuals, institutions not identified with any other sector and foreign performers.

Table 11-2
Payments to other performers, by participating provincial governments — On research and development in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	thousands of dollars				
Newfoundland and Labrador	50	365 E	..	..	..
Prince Edward Island	..	..	..	..	492
New Brunswick	..	589	497	152 E	..
Quebec 1	12,795	12,807	9,179	44,728	61,077
Ontario	34,452	23,321	52,056	13,728	11,173
Manitoba	2,240	2,234	1,327	291	82
Saskatchewan 2	..	1,791 E	6,795	9,935	8,912
Alberta	20,641	16,317	15,124	22,369	11,904
British Columbia	15,679	70,419	4,726 E	6,269	1,109

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.
2. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Note(s): Other performers include the federal government, municipal governments, individuals, institutions not included with any other sector, and foreign performers.

Table 12-1
Personnel of participating provincial governments engaged in scientific activities — By activity and by province

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	number				
Science and technology					
Newfoundland and Labrador	306	350 E	..	..	..
Prince Edward Island	..	..	..	..	196
New Brunswick	..	396	401	389 E	..
Ontario	2,244	2,339	2,210	2,051	2,104
Manitoba	628	601	684	507	465
Saskatchewan 1	..	188 E	323	313	301
Alberta	1,480	1,580	1,649	1,594	1,519
British Columbia	824	821	806 E	840	487
Research and development					
Newfoundland and Labrador	52	53 E	..	..	..
Prince Edward Island	..	..	..	..	33
New Brunswick	..	134	141	137 E	..
Quebec 2	787	773	785	786	837
Ontario	558	617	549	497	538
Manitoba	77	66	133	111	106
Saskatchewan 1	..	71 E	75	63	59
Alberta	731	840	809	811	798
British Columbia	181	196	212 E	225	175
Related scientific activities					
Newfoundland and Labrador	254	297 E	..	..	..
Prince Edward Island	..	..	..	..	163
New Brunswick	..	262	260	252 E	..
Ontario	1,686	1,723	1,662	1,554	1,566
Manitoba	551	535	551	396	359
Saskatchewan 1	..	117 E	249	249	242
Alberta	749	740	840	783	721
British Columbia	643	625	594 E	615	312

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 12-2
Personnel of participating provincial governments engaged in scientific activities — By activity and category, 2010/2011

	Prince Edward Island	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	number						
Total scientific activities	**196**	**..**	**2,104**	**465**	**301**	**1,519**	**487**
Scientific and professional	89	..	1,177	260	192	710	402
Technical	53	..	527	131	58	482	65
Other	53	..	399	74	52	327	19
Research and development	**27**	**654**	**457**	**91**	**30**	**661**	**167**
Scientific and professional	20	410	275	56	23	290	127
Technical	3	202	146	21	7	229	37
Other	3	41	36	14	0	142	3
Administration of extramural programs for research and development	**6**	**183**	**81**	**15**	**29**	**137**	**8**
Scientific and professional	1	101	63	8	6	76	3
Technical	4	46	0	4	0	4	1
Other	1	35	18	2	23	57	4
Related scientific activities	**159**	**..**	**1,477**	**353**	**234**	**636**	**291**
Scientific and professional	66	..	827	191	156	294	255
Technical	46	..	382	104	50	225	28
Other	48	..	268	57	28	117	9
Administration of extramural programs for related scientific activities	**3**	**..**	**89**	**6**	**8**	**85**	**21**
Scientific and professional	2	..	12	5	7	50	17
Technical	0	..	0	1	0	24	0
Other	1	..	77	1	1	11	4

1. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 12-3

Personnel of participating provincial governments engaged in scientific activities — By activity, in the natural sciences and engineering

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	number				
Science and technology					
Newfoundland and Labrador	85	86 E	..	..	..
Prince Edward Island	..	..	..	..	126
New Brunswick	..	285	283	276 E	..
Ontario	1,739	1,820	1,685	1,575	1,714
Manitoba	334	304	320	290	253
Saskatchewan 1	..	130 E	176	157	134
Alberta	1,375	1,403	1,447	1,377	1,324
British Columbia	638	663	641 E	631	287
Research and development					
Newfoundland and Labrador	44	44 E	..	..	..
Prince Edward Island	..	..	..	..	30
New Brunswick	..	111	109	102 E	..
Quebec 2	526	511	526	517	513
Ontario	504	553	488	433	462
Manitoba	56	47	57	68	58
Saskatchewan 1	..	62 E	62	49	40
Alberta	723	822	802	793	781
British Columbia	157	186	203 E	213	160
Related scientific activities					
Newfoundland and Labrador	41	42 E	..	..	..
Prince Edward Island	..	..	..	..	96
New Brunswick	..	174	174	174 E	..
Ontario	1,235	1,268	1,197	1,142	1,252
Manitoba	278	258	263	222	195
Saskatchewan 1	..	68 E	114	108	93
Alberta	652	581	645	584	543
British Columbia	482	477	438 E	419	127

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 12-4
Personnel of participating provincial governments engaged in scientific activities — In the natural sciences and engineering, by activity and category, 2010/2011

	Prince Edward Island	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	number						
Total scientific activities	**126**	**..**	**1,714**	**253**	**134**	**1,324**	**287**
Scientific and professional	49	..	872	113	47	594	219
Technical	35	..	505	106	42	469	56
Other	41	..	337	34	45	261	12
Research and development	**24**	**383**	**394**	**45**	**12**	**656**	**153**
Scientific and professional	17	193	221	26	5	287	113
Technical	3	163	145	15	7	229	37
Other	3	27	28	4	0	140	3
Administration of extramural programs for research and development	**6**	**130**	**68**	**14**	**29**	**125**	**7**
Scientific and professional	1	71	51	8	5	66	3
Technical	4	34	0	4	0	4	1
Other	1	26	18	2	23	55	4
Related scientific activities	**94**	**..**	**1,174**	**193**	**91**	**500**	**118**
Scientific and professional	30	..	594	79	36	228	97
Technical	28	..	361	86	34	213	19
Other	37	..	219	27	21	60	2
Administration of extramural programs for related scientific activities	**1**	**..**	**78**	**2**	**2**	**43**	**10**
Scientific and professional	1	..	6	1	1	13	6
Technical	0	..	0	1	0	23	0
Other	0	..	72	1	1	6	4

1. Since 1994/1995, the Quebec provincial government collects only research and development activities.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 12-5
Personnel of participating provincial governments engaged in scientific activities — In the social sciences and humanities

	2006/2007	2007/2008	2008/2009	2009/2010 [r]	2010/2011
	number				
Newfoundland and Labrador	222	264 [E]	..	..	..
Prince Edward Island	..	..	..	..	70
New Brunswick	..	111	119	113 [E]	..
Ontario	505	519	526	476	390
Manitoba	293	297	364	217	212
Saskatchewan [1]	..	59 [E]	147	156	167
Alberta	105	177	202	216	195
British Columbia	186	158	164 [E]	209	200

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 12-6

Personnel of participating provincial governments engaged in scientific activities — In the social sciences and humanities, by activity and category, 2010/2011

	Prince Edward Island	Quebec [1]	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia
	number						
Total scientific activities	**70**	**..**	**390**	**212**	**167**	**195**	**200**
Scientific and professional	40	..	306	147	144	116	184
Technical	18	..	22	25	16	13	9
Other	12	..	63	41	7	66	7
Research and development	**3**	**271**	**63**	**47**	**18**	**5**	**15**
Scientific and professional	3	217	54	30	18	3	15
Technical	0	39	1	7	0	0	0
Other	0	14	8	11	0	2	0
Administration of extramural programs for research and development	**0**	**53**	**13**	**1**	**1**	**12**	**1**
Scientific and professional	0	31	13	1	0	10	1
Technical	0	13	0	0	0	0	0
Other	0	10	1	0	0	2	0
Related scientific activities	**65**	**..**	**303**	**160**	**143**	**136**	**174**
Scientific and professional	36	..	233	112	120	67	157
Technical	18	..	21	18	16	12	9
Other	11	..	49	30	7	57	7
Administration of extramural programs for related scientific activities	**2**	**..**	**12**	**4**	**6**	**42**	**11**
Scientific and professional	1	..	7	4	6	36	11
Technical	0	..	0	0	0	1	0
Other	1	..	5	0	0	5	0

1. Since 1994/1995, the Quebec provincial government collects only research and development activities.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 13
Participating provincial governments scientists and professionals engaged in scientific activities, by activity and by province

	2006/2007	2007/2008	2008/2009	2009/2010 r	2010/2011
	number				
Science and technology					
Newfoundland and Labrador	252	290 E	..	..	..
Prince Edward Island	..	..	..	..	89
New Brunswick	..	171	180	166 E	..
Ontario	1,105	1,321	1,223	1,104	1,177
Manitoba	385	382	407	311	260
Saskatchewan [1]	..	115 E	210	145	192
Alberta	762	762	707	731	710
British Columbia	483	477	478 E	515	402
Research and development					
Newfoundland and Labrador	41	43 E	..	..	..
Prince Edward Island	..	..	..	..	21
New Brunswick	..	41	48	41 E	..
Quebec [2]	435	436	446	469	512
Ontario	257	378	342	284	338
Manitoba	45	37	77	72	64
Saskatchewan [1]	..	47 E	45	15	28
Alberta	386	389	311	313	366
British Columbia	120	137	146 E	167	131
Related scientific activities					
Newfoundland and Labrador	211	248 E	..	..	..
Prince Edward Island	..	..	..	..	68
New Brunswick	..	130	132	125 E	..
Ontario	848	943	881	820	839
Manitoba	340	345	330	239	196
Saskatchewan [1]	..	68 E	165	131	163
Alberta	376	373	396	418	344
British Columbia	363	340	332 E	348	272

1. Saskatchewan conducted a limited pilot of seven ministries in 2007/2008. The difference in expenditures contributes to the differences between the 2007/2008 pilot survey and 2008/2009 data results including fifteen ministries. A large one time capital expenditure increased related scientific activities expenditures in 2008/2009. Research and development expenditures increased in 2009/2010 due to actual data being received for a ministry which previously provided estimates.
2. Since 1994/1995, the Quebec provincial government collects only research and development activities. These research and development expenditures are not included in the science and technology totals.

Note(s): Full-time equivalent. Components may not add to total due to rounding.

Table 14
Total expenditures of provincial research organizations on scientific activities, by activity and by institute

	2006	2007	2008	2009	2010
	thousands of dollars				
Total science and technology	**75,637**	**111,890**	**99,471**	**92,748**	**156,499**
New Brunswick Research and Productivity Council	8,791	9,070	9,188	9,232	9,789
Centre de recherche industrielle du Québec	31,944	30,358	31,436	25,207	24,490
Industrial Technology Centre (Manitoba)	2,419	2,519	2,782	2,691	2,788
Saskatchewan Research Council	29,859	33,300	36,668	49,158	63,125
Yukon Research Institute	888	809	1,674	2,519	4,950
Nunavut Research Institute	0	0	0	0	48,945
Aurora Research Institute (Northwest Territories)	1,736	35,834	17,723	3,941	2,412
Total research and development	**21,812**	**56,910**	**38,240**	**35,531**	**38,170**
New Brunswick Research and Productivity Council	2,021	2,268	1,838	2,488	2,793
Centre de recherche industrielle du Québec	7,820	8,882	8,323	11,149	10,954
Industrial Technology Centre (Manitoba)	0	0	0	0	0
Saskatchewan Research Council	11,646	11,322	12,101	20,329	20,836
Yukon Research Institute	325	248	1,114	1,506	3,450
Nunavut Research Institute	0	0	0	0	0
Aurora Research Institute (Northwest Territories)	0	34,190	14,864	59	137
Total related scientific activities	**53,826**	**54,980**	**61,231**	**57,217**	**118,329**
New Brunswick Research and Productivity Council	6,770	6,802	7,350	6,744	6,996
Centre de recherche industrielle du Québec	24,125	21,476	23,113	14,058	13,536
Industrial Technology Centre (Manitoba)	2,419	2,519	2,782	2,691	2,788
Saskatchewan Research Council	18,213	21,978	24,567	28,829	42,289
Yukon Research Institute	563	561	560	1,013	1,500
Nunavut Research Institute	0	0	0	0	48,945
Aurora Research Institute (Northwest Territories)	1,736	1,644	2,859	3,882	2,275

Note(s): As of 2010 the Northern Research Institute is known as the Yukon Research Institute . Components may not add to total due to rounding.

Table 15
Distribution of provincial research organization personnel, by institute, 2010

	Research and development			Science and technology		
	Scientific and professional	Technical	Other	Scientific and professional	Technical	Other
	number					
New Brunswick Research and Productivity Council	15	10	7	32	48	17
Centre de recherche industrielle du Québec	50	22	3	137	65	32
Industrial Technology Centre (Manitoba)	0	0	0	5	11	3
Saskatchewan Research Council	71	36	37	113	163	107
Yukon Research Institute	7	0	1	9	0	1
Nunavut Research Institute	0	0	0	0	0	0
Aurora Research Institute (Northwest Territories)	0	0	0	8	5	5

Note(s): Full-time equivalent. As of 2010 the Northern Research Institute is known as the Yukon Research Institute. Components may not add to total due to rounding.

Definitions, data sources, concepts and methods

Foreword

The information in this publication is intended primarily to be used by science and technology (S&T) policy makers, both federal and provincial, largely as a basis for interprovincial and intersectoral comparisons. The surveys which generate these statistical estimates also provide input for the development of the Gross Domestic Expenditures on R&D (GERD), a national aggregate Research and Development (R&D) series, which are used to populate the Canadian components of international questionnaires for the Organization for Economic Co-operation and Development (OECD) and the United Nations Education, Scientific and Cultural Organization (UNESCO) as well as the System of National Accounts.

Data sources

The statistical estimates presented in this publication are aggregate results of provincial government science surveys. The data are collected by individual provinces, and processed by Statistics Canada under contract with the provinces. The provincial government sector consists of all provincial government departments, ministries, selected provincial agencies and provincial research organizations (PRO). The PROs are surveyed by Statistics Canada and also included in this publication. Data presented in this publication cover the period 2006/2007 to 2010/2011.

For the reference period 2010/2011, surveys were conducted in the provinces of Prince Edward Island, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. The respective survey partners included: Prince Edward Island Department of Innovation and Advanced Learning; Ontario Ministry of Economic Development and Innovation; Manitoba Department of Science, Innovation and Business Development; Innovation Saskatchewan; Alberta Advanced Education and Technology and British Columbia Ministry of Jobs, Tourism and Innovation.

Actual expenditure data for reference year 2009/2010 were not obtained from New Brunswick, rather forecasted figures from reference year 2008/2009 have been used in the tables in this publication. Similarly, actual expenditure data were not obtained from British Columbia for reference year 2008/2009 but rather forecasted figures from reference year 2007/2008 were used. Data for reference year 2007/2008 were not obtained for Newfoundland and Labrador. Forecasted figures were used from the province's 2006/2007 survey results. These figures are marked through-out the tables as "use with caution", as they were forecasted and not reported final expenditures. As such, caution should be used when comparing statistics for these provinces over time.

The difference in year-over-year S&T expenditures, in Saskatchewan, can be attributed to the differences between the 2007/2008 pilot survey of seven ministries and the 2008/2009 survey of fifteen ministries. Saskatchewan's S&T expenditures for reference year 2007/2008 are also marked as "use with caution".

The Institut de la Statistique du Québec conducts a similar survey that collects research and development (R&D) expenditure data but does not collect related science activities (RSA) expenditure data. For this reason, an estimate of S&T expenditures cannot be constructed for Quebec.

Concepts and definitions

Science surveys, like other surveys, depend on the respondents' understanding of concepts, definitions and methods of calculation. Accounting records are rarely available in formats which use science-based classifications. Extensive efforts are undertaken each year to support provinces in communicating standard explanations of concepts, definitions and calculations to promote statistical coherence and provincial comparability. The same standards are applied to the data of each province as are applied to data of the federal government and all sectors, according to the principles of the OECD *Frascati Manual 2002* that sets the international standard for the definition and measurement of S&T (R&D and RSA).

This report covers those scientific and technological activities which involve the generation, dissemination and application of new scientific and technological knowledge. The central activity is research and experimental development (R&D). In addition, there are a number of activities closely related to R&D; these are termed related scientific activities (RSA).

Following the *Frascati Manual*, R&D is defined as creative work undertaken on a systematic basis in order to increase the stock of scientific and technical knowledge, including knowledge of humans, culture and society and the use of this stock of knowledge to devise new applications.

R&D requires the acquisition of knowledge and not just information. New knowledge involves the integration of newly acquired information into existing hypotheses or the re-evaluation of existing observations.

The major related scientific activities are education support, technical surveys, statistical surveys, information services, special services and studies, and museum services. Education support and museum services are largely self-explanatory.

Technical surveys are activities directed towards exploration and systematic description of the earth and its natural resources. The activities include gathering, processing, collating and analyzing of data on natural phenomena except when part of a research project or a museum service. The preparation of maps and survey reports, their printing and cataloguing, are also included.

Statistical surveys are activities directed toward the collecting, processing and disseminating of statistics on humankind, their economic and social activities. Included are the development of technical methodology, statistical analysis and vital statistics.

Information services are all work directed to recording, classifying, translating, and disseminating science and technology information. Included are the operations of specialized libraries and archives, the publication of scholarly journals and bibliographies, and the organizing of scientific conferences. Grants for the publication of scholarly works are also included.

Special services and studies in the natural sciences are activities directed towards the establishment of national and provincial standards for materials, devices, products and processes; the calibration of secondary standards; non-routine quality testing; feasibility studies and demonstration projects.

In the social sciences, special services and studies are systematic investigations carried out in order to provide information needed for planning or policy formulation, including feasibility studies and demonstration projects.

Scientific and technological activities take place in both natural sciences and engineering and the social sciences and humanities. The natural sciences and engineering consist of disciplines concerned with understanding, exploring, developing or utilizing the natural world. The social sciences and humanities embrace all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans.

Six performing sectors are identified

1. **Intramural** refers to the provincial ministry, department or agency performing a scientific activity.

2. **Business enterprise** denotes largely private corporations but also includes crown corporations with a commercial function (e.g., power utilities) and industrial research institutes not controlled by another institution.

3. **Higher education sector** covers post secondary educational institutions and affiliated teaching and research facilities.

4. **Hospitals and health organizations –** Canadian hospitals and health organizations which are not part of university medical schools, as well as private non-profit organizations related to health.

5. **Provincial research organizations** include: New Brunswick Research and Productivity Council, Centre de recherche industriel du Québec, Industrial Technology Centre (Manitoba), Saskatchewan Research Council, Northern Research Institute, Nunavut Research Institute, Aurora Research Institute (Aurora College N.W.T.)

6. **Other** includes the federal government, municipal governments, individuals, institutions not identified with any other sector, and foreign performers.

Departmental personnel are classified into three major categories. Scientific and professional includes persons in a job requiring at least one academic degree or nationally recognized professional qualification. The Technical category includes people in jobs requiring specialized vocational or technical training beyond the secondary level. Other includes clerical, secretarial, administrative, operational and other support personnel. Personnel data are reported in full-time equivalent which is simply the portion of a person's time spent on S&T activities.

Objectives of expenditures on scientific activities

The objectives listed on the survey questionnaire do not represent the complete range of possible objectives; however, they are intended to cover the major areas of current technological interest. Respondents are asked to report expenditures under the objective which is primary to that expenditure. The following list of examples although not exhaustive was presented in the survey guide to assist respondents.

Socio-economic objectives allow departments/ministries/agencies to classify their S&T resource allocations according to the purpose for which the expenditure is intended. The objectives are listed on the questionnaire at the highest level of aggregation with sub-levels given here for clarification of categories. In many cases, projects have multiple objectives and a department should assign its expenditures consistent with the stated objectives of the department. Care must be taken to avoid "double counting".

Values are identified by either R&D or RSA, and by either intramural performers or extramural performers.

The objectives are based on the Nomenclature for the Analysis and Comparison of Scientific Programs and Budgets (NABS) produced by the Statistical Office of the European Communities (Eurostat).

1. Exploration and exploitation of the earth - scientific activities with objectives related to the exploration of the earth's crust and mantle, seas, oceans and atmosphere, and scientific activities on their utilization. It also includes climatic and meteorological research (e.g., drought management and the analysis of precipitation standards), polar exploration (under various headings, as appropriate) and hydrology.

– General scientific activities

– Mineral, oil and natural gas prospecting

– Exploration and exploitation of the sea-bed

– Earth's crust and mantle excluding sea-bed and studies of soil for agriculture (6)

– Hydrology - excludes scientific activities on: water supplied and disposal (2) and water pollution (3)

– Sea and oceans

– Climatic and meteorological services

– Atmosphere

– Other scientific activities on the exploration and exploitation of the earth

– Excludes: scientific activities on pollution, soil improvement, land-use and fishing.

2. Infrastructure and general planning of land use - scientific activities on infrastructure and land development, including research on the construction of buildings. More generally, it covers all scientific activities relating to the general planning of land use. This includes scientific activities into protection against harmful effects in town and country planning but not scientific activities into other types of pollution.

2.1 Transportation systems – covers scientific activities on transport systems, including road accident prevention and ancillary services such as electronic traffic aids and radar stations. Also included is general scientific activities on transport systems, road and rail traffic, inland waterway and sea transport, air traffic, pipeline transport systems, works transport systems, combined transport systems and scientific activities on the potential effects on the environment of the planning and operation of transport systems. Scientific activities on transport equipment is included only when it forms part of the co-ordinated programs for the development of improved and safer transport systems, otherwise, such research is classified in Objective 9.

2.2 Telecommunication systems – covers scientific activities on telecommunications services and the planning and organization of telecommunications networks.It includes, in particular, general scientific activities on telecommunications systems, telephones, telex, data transmission, radio and television (including cable TV).

2.3 Other scientific activities on the infrastructure and general planning of Land use i.e.

– General scientific activities

– General planning of land use

– Construction and planning of building

– Civil engineering - excludes scientific activities on building materials and industrial processes (objective 9)

– Water supply

3. Control and care of the environment – covers scientific activities into the control of pollution, aimed at the identification and analysis of the sources of pollution and their causes, and all pollutants, including their dispersal in the environment and the effects on man, species (fauna, flora, micro organisms) and biosphere. Development of monitoring facilities for the measurement of all kinds of pollution is included. The same is valid for the elimination and prevention of all forms of pollution in all types of environment.

– General scientific activities on the environment

– Protection of atmosphere and climate

– Protection of ambient air

– Solid waste

– Protection of ambient water

– Protection of soil and groundwater

– Noise and vibration

– Protection of species and habitats

– Protection against natural hazards

– Radioactive pollution

– Other scientific activities on the environment

4. Protection and improvement of human health - scientific activities aimed at protecting, promoting and restoring human health broadly interpreted to include health aspects of nutrition and food hygiene. It ranges from preventative medicine, including all aspects of medical and surgical treatment, both for individuals and groups, and the provision of hospital and home care, to social medicine and paediatric and geriatric research.

– General scientific activities

– Medical scientific activities, hospital treatment, surgery

– Preventative medicine

– Biomedical engineering and medicines

– Occupational medicine

– Nutrition and food hygiene

– Drug abuse and addiction

– Social medicine

– Hospital structure and organization of medical care

– Other medical scientific activities

5. Production, distribution and rational utilization of energy - covers scientific activities into the production, storage, transportation, distribution and rational use of all forms of energy. It also includes scientific activities on processes designed to increase the efficiency of energy production and distribution, and the study of energy conservation.

– General scientific activities

– Fossil fuels and their derivatives

– Nuclear fission

– Radioactive waste management including decommissioning with regard to fuel/energy

– Hydroelectric energy

– Nuclear fusion

– Conservation

– Renewable energy sources

– Rational utilization of energy

– Other scientific activities on production, distribution and rational utilization of energy

6. Agricultural production and technology - covers scientific activities on animal products, veterinary medicine, crops, agricultural technology, agricultural biotechnology and other scientific activities on agricultural production and technology. It includes: scientific activities on chemical fertilizers, pesticides, insecticides, herbicides, biological pest control and the mechanization of agriculture; evaluation of the impact of scientific activities promoting productivity and technology in agriculture.

7. Fishing – covers scientific activities on fishing, salting, drying and initial freezing of products (but not on preparation and canning; objective 9). Scientific activities on fish-farming, exploration of new fishing grounds, exploration and development of new and unconventional sources of seafood.

8. Forestry – covers scientific activities into the ecological and economic aspects of forestry and timber production.

9. Industrial production and technology - covers scientific activities on the improvement of industrial production and technology. It includes scientific activities on industrial products and their manufacturing processes except where they form an integral part of the pursuit of other objectives (e.g. energy, agriculture, fishing, forestry).

– General scientific activities

– Increasing economic efficiency and competitiveness

– Manufacturing and processing techniques

– Extraction and processing of non-energy minerals and derived products

– Products of the chemical industry

– Petrochemical and coal by-products

– Pharmaceutical products

– Manufacture of motor vehicles and other means of transport

– Aerospace equipment manufacturing and repairing

– Manufacture of motor vehicles and parts

– Manufacture of other modes of transportation

– Electronic and related industries

– Manufacture of office machinery and data-processing equipment

– Manufacture of radio, television and communications equipment and apparatus

– Software development

– Manufacture of electrical machinery and apparatus

– Manufacture of non-electronic and non-electrical machinery

– Manufacture of instruments

– Manufacture of medical and surgical equipment and orthopaedic appliances

– Manufacture of food products and beverages

– Manufacture of clothing and textiles and leather goods

– All other manufacturing products

– Recycling

10. Social structures and relationships – scientific activities on social objectives, as analysed in particular by social and human sciences, which have no obvious connection with other objectives. This analysis includes quantitative, qualitative, organizational and forecasting aspects of social problems.

– General scientific activities

– Education, training, recurrent education and retraining

– Cultural activities, sport and recreation

– Human resources

– Management of businesses and institutions

– Improvement of working conditions

– Social security system

– Political structure of society

– Social change, social processes and social conflicts

– Urban and regional studies

– Other scientific activities with regard to society

11. Exploration and exploitation of space - all civil space scientific activities.Although civil space research is not, in general, concerned with particular objectives, it frequently has a specific goal, such as the increase of general knowledge (e.g., astronomy), or relates to particular applications (e.g., telecommunications satellites).

– General scientific activities

– Applied research programs

– Other research on the exploration and exploitation of space

12. Basic research (advancement of science) - basic activities motivated by scientific curiosity with the objective of increasing scientific knowledge. It also includes funding used to support postgraduate studies and fellowships.

– Mathematics and computer sciences

– Physical sciences

– Chemical sciences

– Biological sciences

– Earth and related (environmental) sciences

– Engineering sciences

– Medical sciences

– Agricultural sciences

– Social sciences

– Humanities

13. Other civil research - civil scientific activities which cannot (yet) be classified to a particular objective.

Data quality

Recognizing that survey data are estimates, they still offer a good representation of science expenditures for the provinces. As in any ongoing statistical exercise, revisions will be necessary as definitions and procedures are clarified by respondents. Data in the tables, denoted with an "E", indicate that these data should be used with caution, as they were obtained from the previous year's survey preliminary data. All survey data are signed off by the respective provincial coordinators. Statistics Canada does not perform any imputation or estimation on these data.

For Gross Domestic Expenditures on R&D (GERD), no estimates are made for provinces for which there are not corresponding surveys. *Gross Domestic Expenditures on Research and Development in Canada and the Provinces, National Estimates 2001 to 2012 Provincial Estimates 2005 to 2010* (Catalogue no. 88-221; CANSIM table 358-0001) are scheduled for publication in November 2012.

Statistics Canada thanks respondents who supported provincial and PRO surveys. Without their invaluable help and cooperation, the production of this report would not have been possible.

History of provincial government S&T surveys

Prior to 1974, estimates of provincial government S&T expenditures were made using provincial estimates and Public Accounts.

In 1974, Ontario, Alberta and Nova Scotia sought the assistance of Statistics Canada in the conduct of surveys of S&T spending by their respective governments. Since then, participation by provincial governments in the collection of S&T survey data has been inconsistent. In 1975, Saskatchewan joined this group, followed by British Columbia in 1977, the same year that Nova Scotia opted out of the survey.

The program was cancelled after the 1977/1978 reference year. The program was reinstated in 1984 under a new business model with participating provinces funding part of the program costs.

In 1984 New Brunswick participated in the survey for their natural sciences expenditures only (no data on social sciences S&T was collected). Manitoba joined in 1985 followed by Newfoundland and Labrador in 1986, Nova Scotia in 1987 and Quebec in 1989.

For reference year 1993/1994, three provinces, Newfoundland and Labrador, New Brunswick and Nova Scotia, did not participate. In 1994/1995, the province of Quebec first began collecting only R&D expenditures as opposed to total S&T. Nova Scotia joined, again, in 1999 and opted out in 2000. In 2001/2002 Saskatchewan did not contract a survey with Statistics Canada and did not participate again until 2006. In 2006, Newfoundland and Labrador took part in the survey, for reference year 2006/2007, but opted out the next year. Both Saskatchewan and New Brunswick participated in 2007. Saskatchewan conducted a limited pilot of data collection from 7 ministries for reference year 2007/2008. For reference year 2008/2009 the survey included 15 ministries. This difference in survey coverage contributes to the year-over-year expenditure and personnel changes. Prince Edward Island participated in 2010.

Table A
Provinces participating in the provincial government scientific activities survey, by year

Year	Province									
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
1974	..	..	x	..	..	x	..	..	x	..
1975	..	..	x	..	..	x	..	x	x	..
1976	..	..	x	..	..	x	..	x	x	..
1977	..	..	..	..	..	x	..	x	x	x
1984	..	..	..	x [1]	..	x	..	x	x	x
1985	..	..	..	x [1]	..	x	x	x	x	x
1986	x	..	..	x [1]	..	x	x	x	x	x
1987	x	..	x	x	..	x	x	x	x	x
1989	x	..	x	x	x	x	x	x	x	x
1990	x	..	x	x	x	x	x	x	x	x
1991	x	..	x	x	x	x	x	x	x	x
1992	x	..	x	..	x	x	x	x	x	x
1993	..	..	..	..	x	x	x	x	x	x
1994	..	..	..	..	x [2]	x	x	x	x	x
1995	..	..	..	..	x [2]	x	x	x	x	x
1996	..	..	..	..	x [2]	x	x	x	x	x
1997	..	..	..	..	x [2]	x	x	x	x	x
1998	..	..	..	..	x [2]	x	x	x	x	x
1999	..	..	x	..	x [2]	x	x	x	x	x
2000	..	..	..	..	x [2]	x	x	x	x	x
2001	..	..	..	..	x [2]	x	x	..	x	x
2002	..	..	..	..	x [2]	x	x	..	x	x
2003	..	..	..	..	x [2]	x	x	..	x	x
2004	..	..	..	..	x [2]	x	x	..	x	x
2005	..	..	..	..	x [2]	x	x	..	x	x
2006	x	..	..	..	x [2]	x	x	..	x	x
2007	..	..	..	x	x [2]	x	x	x [3]	x	x
2008	..	..	..	x	x [2]	x	x	x	x	..
2009	..	..	..	..	x [2]	x	x	x	x	x
2010	..	x	..	..	x [2]	x	x	x	x	x

1. Natural sciences only.
2. R&D expenditures only.
3. Pilot of 7 ministries.

In 2008/2009, British Columbia did not contract Statistics Canada to conduct a survey, but they returned to the survey activity in 2009/2010, the year New Brunswick opted out. In 2008/2009, New Brunswick successfully completed collection for three fiscal years 2007/2008, 2008/2009 and 2009/2010.

In 2010/2011 Provincial Scientific Activities Survey participants included; Prince Edward Island, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia.

Provincial research organizations

Provincial Research Organizations (PRO) have been established by their respective provincial and territorial governments, with a variety of enabling legislation and powers, to:

- provide technical support to primary and secondary industries;
- assist in the exploitation of provincial and territorial natural resources; and
- enhance the economy of their provinces and territories.

Small and medium-sized companies with limited in-house technical capability use the services of these provincial research organizations.

The questionnaire for the Scientific Activities of Provincial Research Organizations: Activities in the natural sciences and engineering was redesigned in reference year 2009.