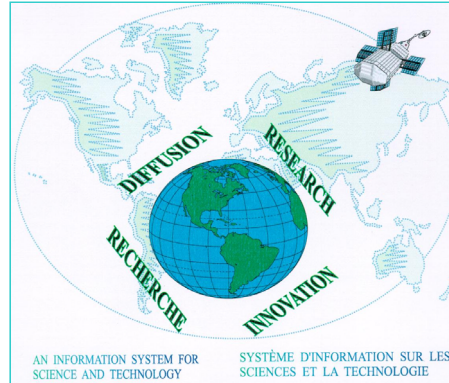


Cat. No. 88F0006XIE2003004

Scientific and Technological Activities of Provincial Governments, 1993-1994 to 2001-2002



SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES OF PROVINCIAL GOVERNMENTS

1993-1994 to 2001-2002

88F0006XIE No. 04

**Prepared by:
Science, Innovation and Electronic Information Division
Statistics Canada**

March 2003

ST-03-04

FOREWORD

The basic mission of the Science, Innovation and Electronic Information Division of Statistics Canada is to assure the availability of pertinent statistical information, to monitor science and technology activities in Canada and to support the development of science and technology policy. This report is one of many produced by the Science and Innovation Surveys Section to respond to these needs.

The information in this document is intended primarily to be used by scientific and technological (S&T) policy makers, both federal and provincial, largely as a basis for interprovincial and intersectoral comparisons. The surveys that generate these statistics also provide input for the development of a national aggregate Research and Development (R&D) series. These national R&D estimates are used to complete international questionnaires for the Organization for Economic Co-operation and Development (OECD) and the United Nations Education, Scientific and Cultural Organization (UNESCO).

The statistics are aggregates of the provincial government science surveys conducted by Statistics Canada under contract with the provinces, and cover the period 1993-1994 to 2001-2002^e. The surveys have covered as many as nine provinces, the exception being Prince Edward Island.

Science surveys, like many other surveys, depend on respondents' interpretation of definitions and methods of calculation. Accounting records are rarely available which use a science-based classification. Recognizing the fact that the data are estimates, they are still a good representation of science expenditures for the provinces. As in any ongoing statistical exercise, revisions will be necessary as definitions and procedures become clarified.

This publication was prepared by **Danielle Bélisle** under the direction of **Lloyd Lizotte**, Subject Matter Manager, Science and Innovation Surveys Section, Science, Innovation and Electronic Information Division.

We want to thank those who replied and collaborated to each of the provincial surveys. Without their invaluable help, the production of this report would not have been possible.

TABLE OF CONTENTS	Page
History of Provincial S&T Surveys	5
Federal/Provincial Workshops on S&T Statistics	5
Definitions	6
Provincial Indicators	7
 Statistical Tables	
 Total Sciences 1993-1994 to 2001-2002	
1. Total Expenditures	9
2. Total Expenditures on R&D	9
3. Personnel by Province	9
4. Scientists and Professionals by Province	10
5. Personnel Engaged in R&D by Province	10
6. Scientists and Professionals Engaged in R&D by Province	10
 2001-2002^e Fiscal Year	
7. Total Expenditures by Sector of Performance	11
8. Total Expenditures on R&D by Sector of Performance	11
9. Personnel by Category	12
 Total Expenditures by Province, by Objective 1996-1997 to 2001-2002	
10. Total Expenditures of the Ontario Government on scientific activities, by Objective, 1996-1997 to 2001-2002	13
11. Total Expenditures of the Manitoba Government on scientific activities, by Objective, 1996-1997 to 2001-2002	14
12. Total Expenditures of the Saskatchewan Government on scientific activities, by Objective, 1996-1997 to 2001-2002	15
13. Total Expenditures of the Alberta Government on scientific activities, by Objective, 1996-1997 to 2001-2002	16
14. Total Expenditures of the British Columbia Government on scientific activities, by Objective, 1996-1997 to 2001-2002	17
15. Total Expenditures of the Ontario Government on R&D, by Objective 1996-1997 to 2001-2002	18
16. Total Expenditures of the Manitoba Government on R&D, by Objective 1996-97 to 2001-2002	19
17. Total Expenditures of the Saskatchewan Government on R&D, by Objective 1996-97 to 2001-2002	20
18. Total Expenditures of the Alberta Government on R&D, by Objective 1996-97 to 2001-2002	21
19. Total Expenditures of the British Columbia Government on R&D, by Objective 1996-97 to 2001-2002	22
 Natural Sciences and Engineering 1993-1994 to 2001-2002	
20. Total Expenditures	24
21. Intramural Expenditures	24
22. Payments to Business Enterprises	24
23. Payments to the Higher Education Sector	25
24. Payments to Other Performers	25
25. Total R&D Expenditures	25
26. Intramural R&D Expenditures	26
27. R&D Payments to Business Enterprises	26
28. R&D Payments to Higher Education Sector	26
29. R&D Payments to Other Performers	27
30. Personnel by Province	27
31. R&D Personnel	27

TABLE OF CONTENTS (concluded)	Page
2001-2002 Fiscal Year	
32. Total Expenditures by Activity	28
33. Total Expenditures by Sector of Performance.....	29
34. Total Expenditures on R&D by Sector of Performance	29
35. Personnel by Category.....	30
36. Total Expenditures by Objective.....	31
37. Total R&D Expenditures by Objective	31
Social Sciences and Humanities 1993-1994 to 2001-2002	
38. Total Expenditures	33
39. Intramural Expenditures	33
40. Total Expenditures on R&D.....	33
41. Personnel by Province	34
2001-2002 Fiscal Year	
42. Total Expenditures by Activity	34
43. Total Expenditures by Sector of Performance.....	35
44. Total R&D by Sector of Performance	35
45. Personnel by Category.....	36
46. Total Expenditures by Objective.....	37
47. Total R&D Expenditures by Objective	37
Provincial Co-ordinators.....	38
How to Order Publications.....	39

History of Provincial S&T Surveys

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

In 1974, Ontario, Alberta and Nova Scotia sought the assistance of Statistics Canada in conducting surveys of S&T spending by their respective governments. In 1975, Saskatchewan joined this group, followed by British Columbia in 1977, Manitoba and New Brunswick in 1984, Newfoundland and Labrador in 1986 and Québec in 1989.

In 1993-94, three provinces, Newfoundland, New Brunswick and Nova Scotia, did not contract with Statistics Canada for a survey due to budget constraints. In 1994-95, the province of Québec collected only R&D expenditures instead of total S&T. For the national R&D statistics, estimates are made for provinces for which there is no survey.

Federal/Provincial Workshops on S&T Statistics

In the fall of 1977, the first Federal-Provincial meeting was held in Ottawa. Representatives from British Columbia, Alberta, Saskatchewan, Ontario and Nova Scotia attended; as well as Statistics Canada and members of the Ministry of State for Science and Technology (MOSST).

The next meeting was held in 1984 with representatives from British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Québec and New Brunswick attending. Statistics Canada sponsored the meeting and invited representatives from MOSST, Energy, Mines and Resources (EMR) and the Science Council. The objectives of the conference were:

- To provide provincial science policy and statistical users with an overview of products and services of the Science and Technology Statistics Division (STSD);
- To provide a forum to allow discussion between STSD and provincial representatives to exchange views on science statistics;
- Achievement of consensus on how to proceed with future provincial surveys.

In 1999, Ontario proposed to Statistics Canada to renew Federal/Provincial conferences and make them an annual event. Statistics Canada agreed and co-hosted the 1999 conference in Toronto. The agenda included topics such as innovation surveys, biotechnology surveys, intellectual properties in higher education, e-commerce and provincial needs and proposals.

Québec and Statistics Canada co-hosted the 2000 conference held in Québec City. Discussions included economic indicators, an innovation study for Ontario, and biotechnology measurement.

In the fall of 2001, British Columbia and Statistics Canada co-hosted the conference in Victoria. Provincial representatives discussed high technology indicators, innovation index, and user needs and challenges. Statistics Canada presented an overview of current program developments and future plans.

Alberta and Statistics Canada co-hosted the 2002 conference held in Edmonton. Discussions included provincial indicators and an overview of current program developments and future plans.

The next meeting will be held in Ottawa in 2003.

Symbols used in this report:

- .. not available for a specific reference point
- ... not applicable
- ^e estimated
- ^r revised

Definitions

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).

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

It 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 information resulting from R&D in the social sciences or required in support of such R&D. 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 science, special services and studies are systematic investigation 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 social sciences and humanities. The natural sciences 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. **Intramural** refers to the provincial ministry or agency performing a scientific activity. **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. **The Higher education sector** cover post secondary educational institutions and affiliated teaching and research facilities. **Hospitals and health organizations** are health organizations such as the Heart Foundation and hospitals which do not belong in the university sector. **Provincial Research Organizations** include the InNOVAcorp (Nova Scotia), the New Brunswick Research and Productivity Council, le Centre de recherche industriel du Québec, ORTECH Corporation (Ontario), Industrial Technology Centre (Manitoba), the Saskatchewan Research Council, the Alberta Research Council, and the NUNAVUT Research Institute. **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.

The objectives listed in this survey do not represent the total 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.

Provincial Indicators, 2000

Province	Population ¹	PGDP ²	GERD ³	GERD/PGDP ³	GERD/Capita
	(000)	(\$ 000,000)	(\$ 000,000)	%	\$
Newfoundland and Labrador	539	14,081	136	1.0	252
Prince Edward Island	138	3,344	36	1.1	261
Nova Scotia	943	24,061	360	1.5	382
New Brunswick	756	19,709	153	0.8	202
Québec*	7,378	223,481	5,186	2.3	703
Ontario*	11,672	429,530	9,305	2.2	797
Manitoba	1,146	33,780	404	1.2	353
Saskatchewan	1,022	33,512	369	1.1	361
Alberta	3,001	143,034	1,283	0.9	428
British Columbia	4,057	127,564	1,500	1.2	370
Canada⁴	30,751	1,056,910	19,634	1.9	638

¹ CANSIM II, Table 051-0005.

² Canadian Economic Observer, Catalogue No. 11-010-XPB, Monthly, October 2002 (Table 41).

³ Estimates of Canadian Research and Development Expenditures (GERD), Canada, 1991 to 2002⁶, and by Province 1991 to 2000, no. 88F0006XIE02015 no. 15, December 2002

⁴ Includes the Yukon and the Northwest Territories, Nunavut and the National Capital Region.

* Québec and Ontario GERD figures exclude Federal Government expenditures of \$893 million performed in the National Capital Region.

Total Budget and Scientific Expenditures of the Federal Government and the Provincial Governments, 2000-2001

Province	Total Budget ¹	S&T Expenditures	R&D Expenditures	S&T % Budget	R&D % Budget
		in millions of dollars		percent	
Federal Government:					
Canada	156,157	6,707	4,150	4.2	2.6
Provincial Governments:					
Québec	46,210	..	436	..	0.9
Ontario	63,389	620	421	1.0	0.6
Manitoba	6,458	52	18	0.8	0.2
Saskatchewan	5,290	96	76	1.8	1.4
Alberta	14,890	264	198	1.7	1.3
British Columbia	22,078	346	207	1.5	0.9

¹ Taken from Budgetary Estimates of the Federal and Provincial Government

Total Sciences

TABLE 1. Total Expenditures of Provincial Governments on Scientific Activities 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Québec	608,710	..	..	..	..	..	..	..	..
Ontario	425,733	425,161	419,980	336,718	314,809	344,778	455,445	619,779	734,180
Manitoba	42,535	47,114	45,825	41,926	39,833	49,082	43,286	52,098	52,537
Saskatchewan	42,043	49,940	49,146	41,832	70,164	75,146	64,040	96,030	93,780
Alberta	207,828	172,000	168,424	168,846	178,388	214,417	234,592	263,794	266,108
British Columbia	205,961	215,187	232,159	247,787	260,839	249,245 ^f	235,686	345,605	235,375

Table 2. Total Expenditures of Provincial Governments on R&D, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Québec	242,011	230,543	218,307	216,246	206,676	213,342 ^f	469,438 ^f	435,643	358,309
Ontario	259,642	250,440	250,863	210,577	210,196	213,553	280,836	421,015	496,994
Manitoba	9,649	11,764	10,608	10,183	7,130	15,087	14,708	17,980	19,255
Saskatchewan	22,801	32,702	31,555	27,908	55,444	56,700	45,941	76,253	71,785
Alberta	129,863	102,693	101,892	110,484	126,470	157,385	173,218	198,117	199,880
British Columbia	74,039	72,622	77,985	89,274	88,684	72,829	72,674	207,042	95,868

Table 3. Personnel of Provincial Governments Engaged in Scientific Activities, by Province, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent								
Québec	4,948	..	..	..	..	..	..	..	..
Ontario	2,668	2,842	2,768	2,003	1,863	1,957	2,101	2,366	2,393
Manitoba	400	358	364	391	407	416	403	427	429
Saskatchewan	275	281	291	203	213	246	250	253	275
Alberta	1,603	1,174	1,048	713	768	812	818	815	833
British Columbia	1,659	1,719	1,618	1,555	1,513	1,441	1,378	1,261	1,273

Table 4. Provincial Government Scientists and Professionals Engaged in Scientific Activities, by Province, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent								
Québec	2,336	..	..	..	..	..	..	..	..
Ontario	1,234	1,257	1,232	857	814	1,118	1,191	1,307	1,332
Manitoba	226	202	204	215	239	250	236	267	271
Saskatchewan	158	166	178	126	134	165	166	172	187
Alberta	615	539	412	329	390	424	373	384	400
British Columbia	873	889	827	787	733	690	657	680	687

Table 5. Personnel of Provincial Governments Engaged in R&D, by Province, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent ¹								
Québec	879	925	806	793	755	666	488	606	587
Ontario	956	987	976	613	567	575	659	688	877
Manitoba	23	21	13	12	27	27	36	41	34
Saskatchewan	68	72	78	52	56	49	52	52	52
Alberta	557	401	337	247	284	299	287	300	310
British Columbia	391	384	270	320	310	302	307	325	329

¹ Including Administration of Extramural R&D Programs Personnel.

Table 6. Provincial Government Scientists and Professionals Engaged in R&D, by Province, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent ¹								
Québec	385	394	354	340	329	290	264	337	324
Ontario	487	506	493	393	357	385	396	412	487
Manitoba	15	17	12	10	19	20	22	33	26
Saskatchewan	31	37	46	36	40	34	34	38	41
Alberta	216	224	169	141	152	167	120	127	134
British Columbia	243	230	159	196	166	167	172	178	172

¹ Including Administration of Extramural R&D Programs Personnel.

Table 7. Total Expenditures of Provincial Governments on Scientific Activities, by Sector of Performance, 2001- 2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Ontario	206,869	21,454	335,193	94,330	...	76,335	734,180
Manitoba	31,773	926	10,073	6,280	750	2,735	52,537
Saskatchewan	19,845	9,586	36,101	1,413	8,669	18,166	93,780
Alberta	72,830	23,815	105,311	7,339	43,637	13,176	266,108
British Columbia	115,083	71,545	43,618	1,757	...	3,372	235,375

Table 8. Total Expenditures of Provincial Governments on R&D, by Sector of Performance, 2001-2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Québec	46,701	5,399	189,028	71,125	18,629	27,427	358,309
Ontario	70,264	6,623	307,888	87,888	...	24,331	496,994
Manitoba	2,404	152	9,853	4,430	750	1,666	19,255
Saskatchewan	3,400	5,631	35,781	1,413	8,592	16,968	71,785
Alberta	29,023	9,829	105,288	5,800	42,017	7,923	199,880
British Columbia	30,605	21,708	40,501	1,322	...	1,732	95,868

Table 9. Personnel of Provincial Governments Engaged in Scientific Activities, by Category, 2001-2002^e

Activity/Category	Ont.	Man.	Sask.	Alta.	B.C.
			full-time equivalent		
Research and development:					
Scientific and professional	487	23	27	102	149
Technical	268	4	2	138	104
Other	94	4	3	1	31
Sub-total	850	31	32	241	284
Related scientific activities:					
Scientific and professional	755	244	140	239	479
Technical	363	95	47	201	153
Other	276	55	27	40	271
Sub-total	1,393	394	214	480	903
Administration of extramural programs:					
Scientific and professional	90	4	20	59	59
Technical	9	0	3	20	17
Other	51	0	6	33	10
Sub-total	150	4	29	112	86
Total scientific activities:					
Scientific and professional	1,332	271	187	400	687
Technical	640	99	52	359	274
Other	421	59	36	74	312
Sub-total	2,393	429	275	833	1,273
Total	2,393	429	275	833	1,273

Table 10. Total Expenditures of the Ontario Government on Scientific Activities, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^g
in thousands of dollars							
Advancement of science	70,352	82,359	83,479	Exploration and Utilization of the Earth	30,441	29,238	31,261
Communications	2,003	1,986	5,829				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	484	50	100	Transportation Systems	3,845	4,332	4,241
Fossil fuels	27	0	0	Telecommunications	19,956	12,961	20,913
Hydro electric energy	0	0	4,250	Other	1,175	1,116	4,248
Renewable resources	0	0	0				
Other	0	0	0	Pollution, Conservation and Protection of the Environment	43,219	50,266	58,159
Environmental issues:							
Air	8,028	6,753	7,423	Public Health	86,613	123,734	137,625
Land	6,123	5,119	5,512				
Water	21,710	18,257	13,998	Production, Distribution and Rational Utilization of Energy	1,758	2,543	1,035
Other	8,975	6,595	11,304				
Health	79,350	66,713	67,148	Agriculture Production and Technology	42,749	48,887	48,661
Industrial and economic development:							
Agriculture	41,955	40,387	38,126	Fishing	3,970	6,846	6,758
Fisheries	3,940	4,259	2,500				
Forestry	8,904	8,432	9,090	Forestry	17,038	13,197	12,029
Manufacturing	39,288	30,933	41,500				
Minerals	5,552	5,668	11,958	Industrial Production and Technology	30,213	47,690	50,322
Other	14,202	10,185	12,385				
Social Development:				Social Development	68,713	48,473	53,168
Culture, sport and recreation	9,628	9,792	10,376				
Education	3,165	2,863	3,191	Exploration and Exploitation of Space	1,405	1,667	1,458
Human resources	3	0	738				
Urban and regional studies	786	786	345	Basic Research	101,571	223,434	297,989
Other	5,656	2,399	11,267				
Transportation	4,530	3,270	3,018	Other Civil Research	2,779	5,395	6,313
Wildlife	1,408	2,298	440				
Other	649	5,705	801				
Total	336,718	314,809	344,778	Total	455,445	619,779	734,180

Table 11. Total Expenditures of the Manitoba Government on Scientific Activities, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	1,385	193	222	Exploration and Utilization of the Earth	4,670	4,320	4,967
Communications	37	161	168				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	35	42	0	Transportation Systems	2,266	2,579	2,708
Fossil fuels	192	162	225	Telecommunications	100	0	0
Hydro electric energy	0	0	0	Other	0	0	0
Renewable resources	0	0	0				
Other	0	0	0	Pollution, Conservation and Protection of the Environment	847	1,383	1,360
Environmental issues:							
Air	404	357	463	Public Health	4,743	9,145	9,357
Land	172	365	114				
Water	1,450	1,176	1,276	Production, Distribution and Rational Utilization of Energy	41	43	44
Other	247	524	129				
Health	5,131	4,862	5,342	Agriculture Production and Technology	3,344	4,172	4,349
Industrial and economic development:							
Agriculture	3,165	3,290	9,440	Fishing	1,390	1,435	1,483
Fisheries	1,306	1,273	1,340				
Forestry	525	530	1,368	Forestry	1,134	1,712	1,690
Manufacturing	3,272	1,885	571				
Minerals	4,368	4,299	4,314	Industrial Production and Technology	12,350	2,444	3,406
Other	6,545	4,026	7,754				
Social Development:				Social Development	12,173	17,775	16,122
Culture, sport and recreation	4,034	4,055	4,387				
Education	4,990	7,666	7,779	Exploration and Exploitation of Space	0	0	0
Human resources	676	657	721				
Urban and regional studies	298	233	235	Basic Research	195	7,035	6,998
Other	931	1,036	922				
Transportation	2,684	2,766	2,312	Other Civil Research	33	55	53
Wildlife	79	275	0				
Other	0	0	0				
Total	41,926	39,833	49,082	Total	43,286	52,098	52,537

Table 12. Total Expenditures of the Saskatchewan Government on Scientific Activities, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	551	556	570				
				Exploration and Utilization of the Earth	0	3,139	3,669
Communications	56	50	324				
				Infrastructure and General Planning of Land Use:			
Energy and fuels:				Transportation Systems	421	1,939	1,821
Conservation	18	0	35	Telecommunications	327	1,072	640
Fossil fuels	275	264	3,267	Other	0	999	1,271
Hydro electric energy	0	0	0				
Renewable resources	0	0	0	Pollution, Conservation and Protection of the Environment	3,408	4,239	5,796
Other	473	477	477				
Environmental issues:				Public Health	11,341	10,272	11,238
Air	154	154	183				
Land	0	0	0	Production, Distribution and Rational Utilization of Energy	2,045	1,100	1,216
Water	709	807	1,212				
Other	1,609	1,631	1,634				
Health	7,513	8,075	9,045	Agriculture Production and Technology	26,555	28,254	30,016
Industrial and economic development:							
Agriculture	13,283	40,012	36,789	Fishing	608	101	101
Fisheries	521	558	572				
Forestry	1,469	1,574	1,688	Forestry	2,246	640	955
Manufacturing	1,304	1,210	1,415				
Minerals	2,455	2,507	4,199	Industrial Production and Technology	8,800	3,517	3,773
Other	4,035	4,270	4,606				
Social Development:				Social Development	7,221	10,290	9,925
Culture, sport and recreation	2,132	2,154	2,490				
Education	1,269	1,158	875	Exploration and Exploitation of Space	0	0	0
Human resources	980	1,471	2,494				
Urban and regional studies	222	222	122	Basic Research	568	30,463	23,359
Other	848	944	2,295				
Transportation	1,525	1,608	384	Other Civil Research	5,001	5	0
Wildlife	431	462	470				
Other	0	0	0				
Total	41,832	70,164	75,146	Total	64,040	96,030	93,780

Table 13. Total Expenditures of the Alberta Government on Scientific Activities, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^r	2001-2002 ^e
in thousands of dollars							
Advancement of science	25,323	15,258	59,146	Exploration and Utilization of the Earth	1,803	5,345	6,260
Communications	0	0	0	Infrastructure and General			
Energy and fuels:				Planning of Land Use:			
Conservation	0	0	0	Transportation Systems	7,026	8,052	7,781
Fossil fuels	23,768	10,404	14,813	Telecommunications	1,943	0	0
Hydro electric energy	0	0	0	Other	2,708	5,163	1,347
Renewable resources	0	0	3				
Other	0	1,699	1,650	Pollution, Conservation and Protection of the Environment	25,020	18,681	19,281
Environmental issues:				Public Health	81,500	71,353	80,553
Air	494	1,304	1,582				
Land	124	118	1,267	Production, Distribution and Rational Utilization of Energy	8,989	7,113	11,550
Water	1,893	11,369	7,952				
Other	10,609	10,495	11,615				
Health	44,297	46,045	51,403				
Industrial and economic development:				Agriculture Production and Technology	43,777	42,050	42,280
Agriculture	34,405	38,925	40,817	Fishing	0	0	5
Fisheries	0	50	350	Forestry	0	4,289	4,318
Forestry	3,633	4,089	1,307	Industrial Production and Technology	600	9	0
Manufacturing	0	17,033	0				
Minerals	33	38	165				
Other	11,672	7,436	6,090				
Social Development:				Social Development	8,720	10,820	10,609
Culture, sport and recreation	7,900	8,222	7,900	Exploration and Exploitation of Space	0	0	0
Education	232	165	167	Basic Research	48,822	84,722	75,869
Human resources	0	0	0	Other Civil Research	3,684	16,130	6,255
Urban and regional studies	460	0	0				
Other	654	1,010	1,003				
Transportation	3,294	4,076	5,996				
Wildlife	55	363	1,186				
Other	0	289	0				
Total	168,846	178,388	214,417	Total	234,592	263,794	266,108

Table 14. Total Expenditures of the British Columbia Government on Scientific Activities, by Objective, 1996-1997 to 2000-2001^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	6,124	1,783	1,708	Exploration and Utilization of the Earth	5,677	5,831	5,199
Communications	850	1,776	849				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	759	805	273	Transportation Systems	865	532	662
Fossil fuels	591	567	535	Telecommunications	873	4,660	5,424
Hydro electric energy	317	285	231	Other	15	25	25
Renewable resources	304	324	254				
Other	5	214	495	Pollution, Conservation and Protection of the Environment	40,693	34,999	34,617
Environmental issues:							
Air	2,248	16,702	10,596	Public Health	27,795	131,796	20,895
Land	16,569	30,238	31,764				
Water	3,654	18,539	13,376	Production, Distribution and Rational Utilization of Energy	338	1,002	942
Other	14,082	13,343	5,084				
Health	23,967	23,409	22,811	Agriculture Production and Technology	1,371	1,513	1,361
Industrial and economic development:							
Agriculture	2,080	2,540	1,482	Fishing	5,097	4,649	4,461
Fisheries	4,793	5,162	7,732				
Forestry	88,725	74,327	85,827 ^f	Forestry	77,439	72,267	75,921
Manufacturing	3,824	4,270	3,881				
Minerals	8,165	6,159	5,665	Industrial Production and Technology	22,835	20,716	20,986
Other	25,340	16,794	18,397				
Social Development:				Social Development	44,285	32,549	51,458
Culture, sport and recreation	15,961	17,474	18,243				
Education	7,327	10,371	8,121	Exploration and Exploitation of Space	0	0	0
Human resources	2,076	2,809	2,032				
Urban and regional studies	2,082	1,798	2,481	Basic Research	4,800	30,304	8,889
Other	5,381	4,970	4,463				
Transportation	2,671	1,161	477	Other Civil Research	3,603	4,763	4,536
Wildlife	9,790	4,984	2,347				
Other	102	35	121				
Total	247,787	260,839	249,245^f	Total	235,686	345,605	235,375

Table 15. Total Expenditures of the Ontario Government on R&D, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^r	2001-2002 ^e
in thousands of dollars							
Advancement of science	42,997	55,248	48,028	Exploration and Utilization of the Earth	2,468	1,570	1,386
Communications	0	100	4,722				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	484	50	0	Transportation Systems	1,315	1,710	1,340
Fossil fuels	27	0	0	Telecommunications	17,882	12,016	12,377
Hydro electric energy	0	0	0	Other	500	0	0
Renewable resources	0	0	0				
Other	0	0	0	Pollution, Conservation and Protection of the Environment	2,587	6,180	6,051
Environmental issues:							
Air	329	290	206	Public Health	78,382	104,618	116,040
Land	245	216	172				
Water	933	772	1,615	Production, Distribution and Rational Utilization of Energy	234	1,819	628
Other	1,762	286	5,050				
Health	65,778	63,826	64,139	Agriculture Production and Technology	35,489	37,603	37,519
Industrial and economic development:							
Agriculture	41,955	40,387	38,126	Fishing	3,970	6,761	6,673
Fisheries	3,265	3,965	2,500				
Forestry	4,581	4,744	3,659	Forestry	14,154	11,293	10,794
Manufacturing	39,288	30,933	41,248				
Minerals	710	710	586	Industrial Production and Technology	21,597	41,236	42,111
Other	0	1,227	0				
Social Development:				Social Development	12,511	10,993	12,565
Culture, sport and recreation	1,082	1,483	0				
Education	944	842	567	Exploration and Exploitation of Space	1,014	1,427	1,218
Human resources	0	0	0				
Urban and regional studies	529	529	71	Basic Research	86,848	182,706	247,164
Other	0	0	1,973				
Transportation	4,530	3,270	691	Other Civil Research	1,885	1,083	1,128
Wildlife	1,138	1,318	200				
Other	0	0	0				
Total	210,577	210,196	213,553	Total	280,836	421,015	496,994

Table 16. Total Expenditures of the Manitoba Government on R&D, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^r	2001-2002 ^e
in thousands of dollars							
Advancement of science	93	193	222	Exploration and Utilization of the Earth	29	0	0
Communications	0	0	0				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	35	42	0	Transportation Systems	62	62	62
Fossil fuels	0	0	0	Telecommunications	0	0	0
Hydro electric energy	0	0	0	Other	0	0	0
Renewable resources	0	0	0				
Other	0	0	0	Pollution, Conservation and Protection of the Environment	0	0	0
Environmental issues:							
Air	25	0	0	Public Health	2,843	7,193	7,407
Land	63	12	0				
Water	40	17	10	Production, Distribution and Rational Utilization of Energy	0	0	0
Other	108	269	3				
Health	3,015	2,962	3,442	Agriculture Production and Technology	1,052	1,280	1,544
Industrial and economic development:							
Agriculture	922	918	6,455	Fishing	0	14	0
Fisheries	0	0	0				
Forestry	125	125	139	Forestry	452	361	318
Manufacturing	3,163	1,786	462				
Minerals	26	12	0	Industrial Production and Technology	9,848	1,399	2,370
Other	2,375	383	4,138				
Social Development:				Social Development	227	636	556
Culture, sport and recreation	5	0	4				
Education	125	348	149	Exploration and Exploitation of Space	0	0	0
Human resources	0	0	0				
Urban and regional studies	0	0	0	Basic Research	195	7,035	6,998
Other	0	0	0				
Transportation	63	63	63	Other Civil Research	0	0	0
Wildlife	0	0	0				
Other	0	0	0				
Total	10,183	7,130	15,087	Total	14,708	17,980	19,255

Table 17. Total Expenditures of the Saskatchewan Government on R&D, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	551	556	570	Exploration and Utilization of the Earth	0	1,723	1,649
Communications	0	0	244				
Energy and fuels:				Infrastructure and General Planning of Land Use:			
Conservation	18	0	35	Transportation Systems	421	1,781	1,671
Fossil fuels	0	0	3,243	Telecommunications	250	846	480
Hydro electric energy	0	0	0	Other	0	0	0
Renewable resources	0	0	0				
Other	473	477	477	Pollution, Conservation and Protection of the Environment	1,678	2,502	3,041
Environmental issues:							
Air	10	0	25	Public Health	8,675	8,155	9,085
Land	0	0	0				
Water	0	0	334	Production, Distribution and Rational Utilization of Energy	2,021	839	869
Other	1,609	1,631	1,634				
Health	5,295	5,917	6,397	Agriculture Production and Technology	25,618	26,975	28,290
Industrial and economic development:							
Agriculture	12,682	39,311	35,475	Fishing	300	0	0
Fisheries	256	274	282				
Forestry	35	37	38	Forestry	540	0	400
Manufacturing	1,105	1,115	1,115				
Minerals	1,498	1,511	2,653	Industrial Production and Technology	5,063	3,149	3,067
Other	2,205	2,200	2,336				
Social Development:				Social Development	0	52	55
Culture, sport and recreation	0	0	0				
Education	0	0	10	Exploration and Exploitation of Space	0	0	0
Human resources	0	0	0				
Urban and regional studies	0	0	0	Basic Research	568	30,226	23,178
Other	323	414	1,000				
Transportation	1,439	1,563	384	Other Civil Research	478	5	0
Wildlife	409	438	448				
Other	0	0	0				
Total	27,908	55,444	56,700	Total	45,941	76,253	71,785

Table 18. Total Expenditures of the Alberta Government on R&D, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	23,859	13,742	53,887	Exploration and Utilization of the Earth	1,803	0	0
Communications	0	0	0	Infrastructure and General Planning of Land Use:			
Energy and fuels:				Transportation Systems	1,519	1,587	1,580
Conservation	0	0	0	Telecommunications	1,943	0	0
Fossil fuels	6,105	10,340	14,754	Other	108	469	187
Hydro electric energy	0	0	0	Pollution, Conservation and Protection of the Environment	3,310	3,241	2,638
Renewable resources	0	0	0	Public Health	75,986	65,921	73,215
Other	0	1,185	1,388	Production, Distribution and Rational Utilization of Energy	8,989	7,113	11,550
Environmental issues:				Agriculture Production and Technology	29,743	28,329	28,559
Air	281	1,191	787	Fishing	0	0	0
Land	0	30	4	Forestry	0	3,192	3,073
Water	157	413	131	Industrial Production and Technology	600	9	0
Other	38	2,079	2,616	Social Development	320	3,317	3,239
Health	40,929	40,893	46,933	Culture, sport and recreation			
Industrial and economic development:				Education			
Agriculture	23,978	27,706	28,041	Human resources			
Fisheries	0	0	0	Urban and regional studies			
Forestry	2,820	3,359	1,287	Other	320	350	320
Manufacturing	0	17,033	0	Basic Research	48,697	84,652	75,839
Minerals	33	38	165	Other Civil Research	200	287	0
Other	11,285	7,141	5,490	Wildlife			
Social Development:				Other			
Culture, sport and recreation	0	0	0	Total	173,218	198,117	199,880
Education	0	0	0				
Human resources	0	0	0				
Urban and regional studies	40	0	0				
Other	320	350	320				
Transportation	633	722	1,281				
Wildlife	6	193	301				
Other	0	55	0				
Total	110,484	126,470	157,385	Total	173,218	198,117	199,880

Table 19. Total Expenditures of the British Columbia Government on R&D, by Objective, 1996-1997 to 2001-2002^e

Former Objective	1996-97	1997-98	1998-99	Current Objective	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars							
Advancement of science	145	100	212	Exploration and Utilization of the Earth	812	544	526
Communications	147	1,191	197	Infrastructure and General Planning of Land Use:			
Energy and fuels:				Transportation Systems	0	38	38
Conservation	680	778	255	Telecommunications	550	4,100	4,100
Fossil fuels	177	145	102	Other	5	25	25
Hydro electric energy	71	32	28	Pollution, Conservation and Protection of the Environment	3,864	3,140	3,140
Renewable resources	62	70	38	Public Health	8,176	121,813	11,321
Other	0	187	470	Production, Distribution and Rational Utilization of Energy	327	992	932
Environmental issues:				Agriculture Production and Technology	713	884	793
Air	816	288	528	Fishing	3,510	3,240	3,054
Land	1,855	1,615	1,132	Forestry	33,817	31,539	31,810
Water	922	1,474	1,281	Industrial Production and Technology	8,695	5,397	5,256
Other	1,785	796	448	Social Development	4,659	9,363	31,183
Health	11,395	10,998	8,927	Exploration and Exploitation of Space	0	0	0
Industrial and economic development:				Basic Research	4,743	22,498	512
Agriculture	1,291	1,544	1,073	Other Civil Research	2,803	3,469	3,178
Fisheries	3,612	3,041	2,402	Wildlife	4,456	3,823	2,328
Forestry	46,704	50,160	39,552	Other	102	35	27
Manufacturing	2,861	2,950	2,692				
Minerals	647	717	858				
Other	7,825	4,047	7,105				
Social Development:							
Culture, sport and recreation	62	800	229				
Education	1,871	1,862	1,540				
Human resources	610	1,011	628				
Urban and regional studies	640	418	777				
Other	0	0	0				
Transportation	538	602	0				
Wildlife	4,456	3,823	2,328				
Other	102	35	27				
Total	89,274	88,684	72,829	Total	72,674	207,042	95,868

Natural Sciences and Engineering

Table 20. Total Expenditures of Provincial Governments on Scientific Activities in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	361,048	..	..	..	..	..	..	..	..
Ontario	300,027	308,661	309,494	243,370	241,142	259,321	342,756	462,904	552,248
Manitoba	26,094	28,468	28,396	27,265	22,657	31,268	27,394	31,010	33,117
Saskatchewan	29,112	37,865	36,483	31,747	58,912	60,649	48,945	80,629	77,779
Alberta	181,189	153,343	156,114	157,212	164,917	202,152	219,770	249,333	251,719
British Columbia	159,726	158,774	180,046	196,079	199,575	190,577 ^f	166,366	287,854	188,052

Table 21. Intramural Expenditures of Provincial Governments on Scientific Activities in the Natural Sciences and Engineering 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	150,773	..	..	..	..	..	..	..	..
Ontario	117,109	140,094	140,042	109,790	97,145	105,481	133,812	133,403	142,329
Manitoba	13,163	12,657	12,515	14,157	13,073	13,933	12,700	14,281	14,974
Saskatchewan	7,581	7,854	8,182	6,741	7,282	8,426	8,016	9,092	10,388
Alberta	69,152	59,737	71,859	57,983	49,432	52,885	58,841	60,020	68,559
British Columbia	81,115	83,643	81,915	87,258	112,791	92,163	70,451	76,488	74,989

Table 22. Payments to Business Enterprises by Provincial Governments for Scientific Activities in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	79,809	..	..	..	..	..	..	..	..
Ontario	41,536	32,755	32,793	11,936	12,079	7,401	6,428	2,184	2,930
Manitoba	3,512	4,358	4,341	4,978	2,477	2,304	288	653	579
Saskatchewan	4,426	11,840	10,424	2,357	3,641	8,263	5,992	5,297	6,919
Alberta	44,096	16,045 ^f	11,503	9,932	15,841	26,242	16,552	21,794	20,150
British Columbia	52,676	52,174	68,836	74,198	56,499	72,402	71,762	63,064	68,216

Table 23. Payments to the Higher Education Sector by Provincial Governments for Scientific Activities in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	58,059	..	..	..	..	..	..	..	..
Ontario	118,133	115,635	115,376	101,748	111,635	118,384	165,622	271,229	290,580
Manitoba	2,692	2,950	2,414	2,354	2,897	5,936	7,853	9,390	9,690
Saskatchewan	9,354	8,945	9,312	10,247	16,505	17,690	16,851	42,105	35,295
Alberta	29,101	28,959	27,244	45,974	55,486	72,634	91,799	101,021	101,948
British Columbia	14,793	12,031	18,584	21,230	22,989	19,148	19,943	34,406	41,072

Table 24. Payments to Other Performers¹ by Provincial Governments for Scientific Activities in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	21,817	..	..	..	..	..	..	..	..
Ontario	8,224	2,543	4,273	5,718	3,531	8,226	11,684	19,851	30,345
Manitoba	1,917	2,061	1,638	1,624	1,653	2,156	1,307	1,662	2,694
Saskatchewan	2,744	4,017	2,910	2,438	21,558	17,094	9,008	14,208	15,166
Alberta	7,418	14,882	21,158	8,011	10,424	14,444	9,136	18,089	11,250
British Columbia	7,009	9,485	10,539	13,143	6,967	6,824	3,920	2,527	2,310

¹ Other performers include the federal government, municipal governments, individuals, institutions not identified with any other sector, and foreign performers.

Table 25. Total Expenditures of Provincial Governments on R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	196,265	184,223	171,187	167,934	156,645	149,787 ^f	384,391	328,817	251,774
Ontario	213,042	210,148	212,252	176,840	181,163	186,070	235,049	350,567	429,147
Manitoba	8,851	9,709	9,422	9,571	6,374	14,424	14,192	16,934	18,231
Saskatchewan	19,997	30,046	28,808	25,449	52,400	52,900	41,902	72,750	68,304
Alberta	125,280	101,826	101,419	110,086	125,870	156,815	172,598	193,558	196,076
British Columbia	71,346	69,568	74,612	86,477	85,377	69,152	69,663	196,956	93,899

Table 26. Intramural Expenditures of Provincial Governments on R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Newfoundland and Labrador	4,000	4,000	4,000	4,000	4,000	4,000	4,000	5,000	5,000
Nova Scotia	5,000	5,000	5,000	5,000	5,000	5,000	5,000	6,000	6,000
New- Brunswick	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Québec	46,379	42,822	39,602	39,287	37,436	35,546	32,150	33,851	33,299
Ontario	57,300	65,308	66,732	49,119	41,299	43,183	58,839	65,014	67,008
Manitoba	861	716	529	436	1,078	1,212	1,560	1,890	1,730
Saskatchewan	3,422	3,416	3,835	3,002	3,233	2,885	2,771	2,980	3,263
Alberta	25,423	25,028	25,301	18,439	18,529	21,513	26,077	28,894	28,939
British Columbia	25,778	28,127	21,054	25,294	27,239	23,729	25,814	32,248	30,568

Table 27. Payments to Business Enterprises by Provincial Governments for R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Québec	36,395	29,341	24,192	18,713	14,672	13,138	27,082	6,845	5,285
Ontario	24,054	17,631	18,214	11,247	11,168	6,225	4,520	1,527	1,774
Manitoba	3,414	4,270	4,103	3,487	615	447	87	62	90
Saskatchewan	1,966	9,622	8,244	908	2,241	6,637	4,423	4,305	5,631
Alberta	35,889	6,835	5,305	5,565	10,705	19,777	5,702	7,741	9,769
British Columbia	23,545	22,496	28,973	31,593	30,627	26,427	23,357	19,438	21,708

Table 28. Payments to the Higher Education Sector by Provincial Governments for R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Québec	57,153	68,884	63,680	59,451	56,216	50,896	124,959	149,369	112,720
Ontario	108,923	108,506	108,450	101,558	111,613	115,419	144,607	247,947	268,653
Manitoba	2,688	2,950	2,389	2,354	2,897	5,934	7,853	9,390	9,580
Saskatchewan	9,017	8,502	8,872	9,751	15,975	17,372	16,841	41,936	34,995
Alberta	27,613	28,475	27,056	45,807	55,404	68,922	91,369	101,019	101,948
British Columbia	13,582	10,275	17,016	20,023	21,707	17,493	18,125	32,394	39,001

Table 29. Payments to Other Performers¹ by Provincial Governments for R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	in thousands of dollars								
Québec	6,189 ^f	6,147	7,004	11,671	11,327	12,328	121,062	60,636	20,942
Ontario	7,982	1,585	2,180	938	621	1,414	4,272	2,435	8,126
Manitoba	994	738	278	185	261	779	333	568	1,651
Saskatchewan	706	3,382	2,288	1,874	21,075	16,830	8,789	13,602	14,410
Alberta	5,776	12,919	19,916	6,359	8,711	11,824	6,983	16,130	7,603
British Columbia	4,308	7,248	7,423	9,317	5,519	1,503	2,367	1,846	1,592

¹ Other performers include the federal government, municipal governments, individuals, institutions not identified with any other sector, and foreign performers.

Table 30. Personnel of Provincial Governments Engaged in Scientific Activities in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent								
Québec	2,634	..	..	..	..	..	..	..	..
Ontario	1,511	1,715	1,723	1,288	1,209	1,256	1,408	1,622	1,641
Manitoba	240	209	209	214	192	195	196	210	207
Saskatchewan	148	150	158	107	110	121	125	127	143
Alberta	1,299	957	926	611	664	705	675	766	774
British Columbia	1,118	1,129	1,045	1,023	943	895	853	835	838

Table 31. Personnel of Provincial Governments Engaged in R&D in the Natural Sciences and Engineering, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent								
Québec	619	690	576	543	532	479	388	434	410
Ontario	760	800	817	500	479	461	607	633	877
Manitoba	20	19	11	9	22	22	30	29	25
Saskatchewan	123	119	131	75	79	76	82	78	80
Alberta	542	383	336	246	283	299	287	299	309
British Columbia	366	363	260	311	298	295	300	319	329

Table 32. Total Expenditures of Provincial Governments on Scientific Activities in the Natural Sciences and Engineering, by Activity, 2001-2002^e

Activity	Ont.	Man.	Sask.	Alta.	B.C.
in thousands of dollars					
Research and development :					
Current expenditures:					
In-house	58,361	1,525	2,030	20,848	25,722
Contracts	39,656	40	25,982	5,899	7,867
Grants	320,543	15,636	38,559	161,349	53,939
Research fellowships	2,072	850	500	70	1,610
Administration of extramural R&D programs	5,479	180	1,233	7,880	4,606
Sub-total	426,111	18,231	68,304	196,046	93,744
Capital expenditures	3,036	0	0	30	155
Total R&D	429,147	18,231	68,304	196,076	93,899
Related scientific activities :					
Current expenditures:					
Education Support	15,640	18	50	432	861
Technical Suveys	54,908	8,676	5,018	28,502	52,387
Information Services	18,189	444	631	11,359	25,583
Special Services and Studies	15,889	5,418	1,424	11,888	5,289
Museum Services	9,267	330	1,287	2,650	8,265
Administration of extramural RSA programs	8,093	0	480	607	1,718
Sub-total	121,986	14,886	8,890	55,438	94,103
Capital expenditures	1,115	0	585	205	50
Total RSA	123,101	14,886	9,475	55,643	94,153
Total	552,248	33,117	77,779	251,719	188,052

Table 33. Total Expenditures of Provincial Governments on Scientific Activities in the Natural Sciences and Engineering, by Sector of Performance, 2001-2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Ontario	142,329	2,930	290,580	86,064	...	30,345	552,248
Manitoba	14,974	579	9,690	4,430	750	2,694	33,117
Saskatchewan	10,388	6,919	35,295	1,413	8,598	15,166	77,779
Alberta	68,559	20,150	101,948	6,175	43,637	11,250	251,719
British Columbia	74,989	68,216	41,072	1,465	...	2,310	188,052

Table 34. Total Expenditures of Provincial Governments on R&D in the Natural Sciences and Engineering, by Sector of Performance, 2001-2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Québec	33,299	5,285	112,720	61,872	17,656	20,942	251,774
Ontario	67,008	1,774	268,653	83,586	...	8,126	429,147
Manitoba	1,730	90	9,580	4,430	750	1,651	18,231
Saskatchewan	3,263	5,631	34,995	1,413	8,592	14,410	68,304
Alberta	28,939	9,769	101,948	5,800	42,017	7,603	196,076
British Columbia	30,568	21,708	39,001	1,030	...	1,592	93,899

Table 35. Personnel of Provincial Governments Engaged in Scientific Activities in the Natural Sciences and Engineering, by Category, 2001-2002^e

Activity/Category	Ont.	Man.	Sask.	Alta.	B.C.
	full-time equivalent				
Research and development:					
Scientific and professional	469	15	25	102	148
Technical	259	4	2	138	104
Other	88	3	3	1	31
Sub-total	816	22	30	241	283
Related scientific activities:					
Scientific and professional	436	77	45	223	216
Technical	249	85	31	191	116
Other	25	20	12	28	143
Sub-total	710	182	88	442	475
Administration of extramural programs:					
Scientific and professional	70	3	16	40	53
Technical	7	0	3	20	17
Other	39	0	6	31	10
Sub-total	116	3	25	91	80
Total scientific activities:					
Scientific and professional	974	95	86	365	417
Technical	514	89	36	349	237
Other	153	23	21	60	184
Sub-total	1,641	207	143	774	838
Total	1,641	207	143	774	838

Table 36. Total Expenditures of Provincial Governments on Scientific Activities in the Natural Sciences and Engineering, by Objective, 2001-2002^e

Objective	Ont.	Man.	Sask.	Alta.	B.C.
		in thousands of dollars			
Exploration and Utilization of the Earth	31,261	4,967	3,669	6,260	5,199
Infrastructure and General Planning of Land Use:					
Transportation Systems	3,394	2,708	1,721	7,781	662
Telecommunications	3,934	0	530	0	4,100
Other	661	0	1,171	817	25
Pollution, Conservation and Protection of the Environment	57,469	1,325	4,996	19,042	34,438
Public Health	84,177	7,290	5,832	75,072	10,361
Production, Distribution and Rational Utilization of Energy	585	0	1,056	11,550	942
Agriculture Production and Technology	48,661	4,030	29,916	42,280	1,361
Fishing	6,733	1,483	11	5	4,461
Forestry	12,029	1,690	855	4,288	72,120
Industrial Production and Technology	47,195	2,424	3,479	0	9,871
Social Development	4,095	330	1,357	2,500	32,015
Exploration and Exploitation of Space	1,458	0	0	0	0
Basic Research	247,918	6,870	23,186	75,869	8,784
Other Civil Research	2,678	0	0	6,255	3,713
Total	552,248	33,117	77,779	251,719	188,052

Table 37. Total Expenditures of Provincial Governments on R&D in the Natural Sciences and Engineering, by Objective, 2001-2002^e

Objective	Ont.	Man.	Sask.	Alta.	B.C.
		in thousands of dollars			
Exploration and Utilization of the Earth	1,386	0	1,649	0	526
Infrastructure and General Planning of Land Use:					
Transportation Systems	687	62	1,671	1,580	38
Telecommunications	3,121	0	480	0	4,100
Other	0	0	0	187	25
Pollution, Conservation and Protection of the Environment	6,051	0	3,041	2,638	3,140
Public Health	76,662	7,190	5,701	72,650	9,383
Production, Distribution and Rational Utilization of Energy	428	0	869	11,550	932
Agriculture Production and Technology	37,519	1,421	28,290	28,559	793
Fishing	6,673	0	0	0	3,054
Forestry	10,794	318	400	3,073	31,810
Industrial Production and Technology	41,636	2,370	3,067	0	5,256
Social Development	0	0	0	0	31,152
Exploration and Exploitation of Space	1,218	0	0	0	0
Basic Research	241,944	6,870	23,136	75,839	512
Other Civil Research	1,028	0	0	0	3,178
Total	429,147	18,231	68,304	196,076	93,899

Social Sciences and Humanities

Table 38. Total Expenditures of Provincial Governments on Scientific Activities in the Social Sciences and Humanities, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	247,662	..	..	..	..	..	..	..	..
Ontario	125,706	116,500	110,486	93,348	73,667	85,457	112,689	156,875	181,932
Manitoba	16,441	18,646	17,429	14,661	17,176	17,814	15,892	21,088	19,420
Saskatchewan	12,931	12,075	12,663	10,085	11,252	14,497	15,095	15,401	16,001
Alberta	26,639	18,657	12,310	11,634	13,471	12,265	14,822	14,461	14,389
British Columbia	46,235	56,413	52,113	51,708	61,264	58,668	69,320	57,752	47,323

Table 39. Intramural Expenditures of Provincial Governments on Scientific Activities in the Social Sciences and Humanities, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	148,139	..	..	..	..	..	..	..	..
Ontario	70,938	71,237	66,001	50,048	46,413	50,903	50,993	57,405	64,540
Manitoba	10,583	9,296	9,859	11,732	13,799	14,491	13,050	18,338	16,799
Saskatchewan	8,785	8,370	8,850	6,185	6,772	9,377 ^f	9,316	9,200	9,457
Alberta	18,828	14,252	8,230	7,384	7,551	7,908	9,185	3,741	4,271
British Columbia	39,677	43,521	43,058	40,895	41,720	43,133	50,339	41,002	40,094

Table 40. Total Expenditures of Provincial Governments on R&D in the Social Sciences and Humanities, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
in thousands of dollars									
Québec	45,746	46,320	47,120	48,312	50,031 ^f	63,555 ^f	85,047 ^f	106,826	106,535
Ontario	46,600	40,292	38,611	33,737	29,033	27,483	45,787	70,448	67,847
Manitoba	798	2,055	1,186	612	756	663	516	1,046	1,024
Saskatchewan	2,804	2,656	2,747	2,459	3,044	3,800	4,039	3,503	3,481
Alberta	4,583	867	473	398	600	570	620	4,559	3,804
British Columbia	2,693 ^f	3,054	3,373	2,797	3,307	3,677	3,011	10,086	1,969

Table 41. Personnel of Provincial Governments Engaged in Scientific Activities in the Social Sciences and Humanities, 1993-1994 to 2001-2002^e

Province	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001 ^f	2001-2002 ^e
	full-time equivalent								
Québec	2,314	..	..	..	..	..	..	..	..
Ontario	1,157	1,127	1,045	715	654	701	694	744	751
Manitoba	160	149	155	177	215	221	206	217	222
Saskatchewan	127	131	133	96	103	125	125	126	132
Alberta	304	217	122	102	104	107	143	49	59
British Columbia	541	590	573	532	570	546	525	426	435

Table 42. Total Expenditures of Provincial Governments on Scientific Activities in the Social Sciences and Humanities, by Activity, 2001-2002^e

Activity	Ont.	Man.	Sask.	Alta.	B.C.
	in thousands of dollars				
Research and development :					
Current expenditures					
In-house	1,342	650	97	25	22
Contracts	11,207	99	0	41	140
Grants	51,830	223	3,308	3,180	1,792
Research fellowships	1,554	50	36	540	0
Administration of extramural R&D programs	1,814	0	40	18	0
Sub-total	67,747	1,022	3,481	3,804	1,954
Capital expenditures	100	2	0	0	15
Total R&D	67,847	1,024	3,481	3,804	1,969
Related scientific activities :					
Current expenditures	105,000	18,329	12,271	9,297	43,510
Administration of extramural RSA programs	1,890	8	249	1,288	423
Sub-total	106,890	18,337	12,520	10,585	43,933
Capital expenditures	7,196	59	0	0	1,421
Total RSA	114,085	18,396	12,520	10,585	45,354
Total	181,932	19,420	16,001	14,389	47,323

Table 43. Total Expenditures of Provincial Governments on Scientific Activities in the Social Sciences and Humanities, by Sector of Performance, 2001-2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Ontario	64,540	18,524	44,613	8,266	...	45,990	181,932
Manitoba	16,799	347	383	1,850	0	41	19,420
Saskatchewan	9,457	2,667	806	0	71	3,000	16,001
Alberta	4,271	3,665	3,363	1,164	0	1,926	14,389
British Columbia	40,094	3,329	2,546	292	...	1,062	47,323

Table 44. Total Expenditures of Provincial Governments on R&D in the Social Sciences and Engineering, by Sector of Performance, 2001-2002^e

Province	Intramural	Business Enterprise	Higher Education	Hospitals and Health Organisations	Provincial Research Organisations	Other	Total
in thousands of dollars							
Québec	13,402	114	76,308	9,253	973	6,485	106,535
Ontario	3,256	4,849	39,235	4,302	...	16,205	67,847
Manitoba	674	62	273	0	0	15	1,024
Saskatchewan	137	0	786	0	0	2,558	3,481
Alberta	84	60	3,340	0	0	320	3,804
British Columbia	37	0	1,500	292	...	140	1,969

Table 45. Personnel of Provincial Governments Engaged in Scientific Activities in the Social Sciences and Humanities, by Category, 2001-2002^e

Activity/Category	Ont.	Man.	Sask.	Alta.	B.C.
	full-time equivalent				
Research and development:					
Scientific and professional	19	8	2	0	1
Technical	10	0	0	0	0
Other	6	1	0	0	0
Sub-total	34	9	2	0	1
Related scientific activities:					
Scientific and professional	319	167	95	16	263
Technical	114	10	16	10	37
Other	251	35	15	12	128
Sub-total	684	212	126	38	428
Administration of extramural programs:					
Scientific and professional	20	1	4	19	6
Technical	2	0	0	0	0
Other	12	0	0	2	0
Sub-total	34	1	4	21	6
Total scientific activities:					
Scientific and professional	358	176	101	35	270
Technical	125	10	16	10	37
Other	268	36	15	14	128
Sub-total	751	222	132	59	435
Total	751	222	132	59	435

Table 46. Total Expenditures of Provincial Governments on Scientific Activities in the Social Sciences and Humanities, by Objective, 2001-2002^e

Objective	Ont.	Man.	Sask.	Alta.	B.C.
			in thousands of dollars		
Exploration and Utilization of the Earth	0	0	0	0	0
Infrastructure and General Planning of Land Use:					
Transportation Systems	847	0	100	0	0
Telecommunications	16,979	0	110	0	1,324
Other	3,587	0	100	530	0
Pollution, Conservation and Protection of the Environment	690	35	800	239	179
Public Health	53,448	2,067	5,406	5,481	10,534
Production, Distribution and Rational Utilization of Energy	450	44	160	0	0
Agriculture Production and Technology	0	319	100	0	0
Fishing	25	0	90	0	0
Forestry	0	0	100	30	3,801
Industrial Production and Technology	3,127	982	294	0	11,115
Social Development	49,073	15,792	8,568	8,109	19,443
Exploration and Exploitation of Space	0	0	0	0	0
Basic Research	50,071	128	173	0	105
Other Civil Research	3,635	53	0	0	823
Total	181,932	19,420	16,001	14,389	47,323

Table 47. Total Expenditures of Provincial Governments on R&D in the Social Sciences and Humanities, by Objective, 2001-2002^e

Objective	Ont.	Man.	Sask.	Alta.	B.C.
			in thousands of dollars		
Exploration and Utilization of the Earth	0	0	0	0	0
Infrastructure and General Planning of Land Use:					
Transportation Systems	653	0	0	0	0
Telecommunications	9,256	0	0	0	0
Other	0	0	0	0	0
Pollution, Conservation and Protection of the Environment	0	0	0	0	0
Public Health	39,378	217	3,384	565	1,938
Production, Distribution and Rational Utilization of Energy	200	0	0	0	0
Agriculture Production and Technology	0	123	0	0	0
Fishing	0	0	0	0	0
Forestry	0	0	0	0	0
Industrial Production and Technology	475	0	0	0	0
Social Development	12,565	556	0	3,239	31
Exploration and Exploitation of Space	0	0	0	0	0
Basic Research	5,220	128	0	0	0
Other Civil Research	100	0	0	0	0
Total	67,847	1,024	3,384	3,804	1,969

PROVINCIAL CO-ORDINATORS

Five provincial governments are currently sponsoring the Science and Innovation Surveys Section in the collection of similar scientific activity data. Below is a list of co-ordinators for the various sponsoring Departments/Ministries.

Stephanie Holbik
Manager, Innovation Information and Awareness Section
Ministry of Enterprise, Opportunity and Innovation
56 Wellesley Street West, 11th Floor
Toronto, ON M7A 2E7
Phone: (416) 314-8209
E-mail: stephanie.holbik@eoi.gov.on.ca

Mr. Dennis Lowe
Analyst, Policy and Strategic Planning Branch
Saskatchewan Economic & Cooperative Development
800 - 1919 Saskatchewan Drive
Regina, Saskatchewan
S4P 4V7 Tel.: (306) 787-9549
Email: dennis.lowe@ecd.gov.sk.ca

Mr. Tom Penner
Project Manager
Manitoba Industry, Trade and Mines
500-155 Carlton Street,
Winnipeg, Manitoba
R3C 3H8 Tel.: (204) 945-0152
e-mail: tpenner@gov.mb.ca

Elizabeth deMunck
Program Analyst
Ministry of Competition, Science and Enterprise
PO Box 9411 Stn Prov Govt
Victoria, British Columbia
V8W 9V1 Tel.: (250) 952-0255
e-mail: elizabeth.demunck@gems3.gov.bc.ca

Mme C. Charron
Direction des statistiques sur les industries
Institut de la statistique du Québec
200, chemin Sainte-Foy
Québec, Québec
G1K 5T4 Tél.: (418) 691-2408
e-mail: christiane.charron@bsq.gouv.qc.ca

Mr. Grant S.McIntyre
Life Sciences Analyst
Alberta Innovation and Science
10365-97th Street
9th Floor, Brownlee Building
Edmonton, Alberta
T5J 3W7 Tel.: (780) 415-6020
e-mail: grant.mcintyre@gov.ab.ca

How to Order Publications

Statistics Canada catalogued publications may be purchased from local authorized agents, other community bookstores, and Statistics Canada Regional Reference Centre or from:

Statistics Canada
Dissemination Division
Circulation Management,
120 Parkdale Avenue,
Ottawa, Ontario
K1A 0T6

Telephone: 1(613) 951-7277
National (toll free order line): 1-800-700-1033
Fax number: 1(613) 951-1584 or 1-800-889-9734
Toronto: Credit Card only (416) 973-8018
Internet: order@statcan.ca
[Http://www.statcan.ca/english/IPS/Data/88-001-XIB.htm](http://www.statcan.ca/english/IPS/Data/88-001-XIB.htm)

CATALOGUED PUBLICATIONS

Statistical Publication

- 88-202-XIB Industrial Research and Development, 2002 Intentions (with 2001 preliminary estimates and 2000 actual expenditures)
- 88-204-XIE Federal Scientific Activities, 2001-2002^e (annual)
- 88-001-XIB Science Statistics (monthly)

Volume 26

- No. 1 The Provincial Research Organizations, 1999
- No. 2 Biotechnology Scientific Activities Selected Federal Government Departments and Agencies, 2000-2001
- No. 3 Estimates of Total Spending on Research & Development in the Health Field in Canada, 1988 to 2000^p
- No. 4 Industrial Research and Development, 1998 to 2002
- No. 5 Federal Government Expenditures on Scientific Activities, 2002-2003
- No. 6 Estimation of Research and Development Expenditures in the Higher Education Sector, 2000-2001
- No. 7 Total Spending on Research and Development in Canada, 1990 to 2002^p, and Provinces, 1990 to 2000
- No. 8 The Provincial Research Organizations, 2000
- No. 9 Research and Development (R&D) Expenditures of Private Non-Profit (PNP) Organization, 2001

Volume 27

- No. 1 Biotechnology Scientific Activities in Selected Federal Government Departments and Agencies, 2001-2002
- No. 2 Scientific and Technological (S&T) Activities of Provincial Government, 1993-94 TO 2001-2002^e

WORKING PAPERS – 2002

- ST-02-01E Innovation, and change in the Public Sector : A Seeming Oxymoron, January 2002
- ST-02-02E Measuring the Networked Economy, March 2002
- ST-02-03E Use of Biotechnologies in the Canadian industrial Sector: Results from the Biotechnology Use & Development Survey – 1999, March 2002

- ST-02-04E Profile of Spin-off Firms in the Biotechnology Sector: Results from the Biotechnology Use and Development Survey – 1999, March 2002
- ST-02-05E Scientific and Technological Activities of Provincial Governments 1992-1993 to 2000-2001^e, April 2002
- ST-02-06E Are we Managing our Knowledge? Results from the Pilot Knowledge Management Practices Survey, 2001, April 2002
- ST-02-07E Estimates of Total Expenditures on Research and Development in the Health Fields in Canada, 1988 to 2001^p, May 2002
- ST-02-08E Provincial Distribution of Federal Expenditures and Personnel on Science and Technology, 1991-92 to 1999-2000, May 2002
- ST-02-09E An Overview of Organisational and Technological Change in the Private Sector, 1998-2000, June 2002
- ST-02-10E Federal Government Expenditures and Personnel in the Natural and Social Sciences, 1992-1993 to 2001-2002^p, June 2002
- ST-02-11E Innovation in the Forest Sector, June 2002
- ST-02-12E Survey of Innovation 1999, Methodological Framework: Decisions Taken and Lessons Learned, June 2002
- ST-02-13E Innovation and the Use of Advanced Technologies in Canada's Mineral Sector: Metal Ore Mining, June 2002
- ST-02-14E Estimation of Research and Development Expenditures in the Higher Education Sector, 2000-2001, December 2002
- ST-02-15E Estimates of Canadian Research and development Expenditures (GERD) Canada, 1991 to 2002^p , and by Province 1991 to 2000, December 2002
- ST-02-16E Survey of Innovation 1999, Statistical Tables, Manufacturing Industries, Canada, December 2002
- ST-02-17E Factors Governing Product and Process Innovations in Canada's Dynamic Service Industries, December 2002

WORKING PAPERS – 2003

- ST-03-01E A Comparison of International R&D Performance: An Analysis of Countries that have Significantly Increase their GERD/GDP Ratio during the Period 1989-1999
- ST-03-02E Who's Sharing What With Whom? How Canadian Businesses Used Electronic Networks to Share Information in 2001.
- ST-03-03E How is the Canadian Biotechnology Evolving: A Comparison of the 1997 and 1999 Biotechnology Use and Development Surveys

RESEARCH PAPERS

- No. 1 The State of Science and Technology Indicators in the OECD Countries, by Benoit Godin, August 1996
- No. 2 Knowledge as a Capacity for Action, by Nico Stehr, June 1996
- No. 3 Linking Outcomes for Workers to Changes in Workplace Practices: An Experimental Canadian Workplace and Employee Survey, by Garnett Picot and Ted Wannell, June 1996
- No. 4 Are the Costs and Benefits of Health Research Measurable? by M.B. Wilk, February 1997
- No. 5 Technology and Economic Growth: A Survey, by Peter Hanel and Jorge Niosi, April 1998
- No. 6 Diffusion of Biotechnologies in Canada, by Anthony Arundel, February 1999
- No. 7 Barriers to Innovation in Services Industries in Canada, by Pierre Mohnen and Julio Rosa, November 1999
- No. 8 Explaining Rapid Growth in Canadian Biotechnology Firms, by Jorge Niosi, August 2000
- No. 9 Internationally Comparable Indicators on Biotechnology: A Stocktaking, a Proposal for Work and Supporting Material, by W.Pattinson, B. Van Beuzekom and A. Wyckoff, January 2001
- No. 10 Analysis of the Survey on Innovation, Advanced Technologies and Practices in the Construction and Related Industries, 1999, by George Seaden, Michael Guolla, Jérôme Doutriaux and John Nash, January 2001

- No. 11 Capacity to Innovate, Innovation and Impact: The Canadian Engineering Services Industry, by Daood Hamdani, March 2001
- No. 12 Patterns of Advanced Manufacturing Technology (AMT) Use in Canadian Manufacturing:1998 AMT Survey Results, by Anthony Arundel and Viki Sonntag, November 2001