

# Federal government spending on science and technology, 2016/2017 (final), 2017/2018 (preliminary) and 2018/2019 (intentions)

*Released at 8:30 a.m. Eastern time in The Daily, Tuesday, March 27, 2018*

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## **Federal government science and technology spending intentions down in 2018/2019 following record levels in 2017/2018**

Federal government science and technology (S&T) spending intentions are anticipated to decrease by 6.1% in 2018/2019, to \$11.3 billion. This decline follows increases of 9.4% in 2016/2017 and 5.7% in 2017/2018, when expenditures reached a record \$12.1 billion, surpassing the previous high of \$11.6 billion in 2009/2010. The intentions for this release were collected from August 15 to November 30, 2017.

Lower spending on research and development (R&D) activities is anticipated to account for three-quarters of the drop in 2018/2019, down 7.3% to \$7.1 billion. Spending on related scientific activities (RSA) is also anticipated to decrease, down 4.1% to \$4.3 billion.

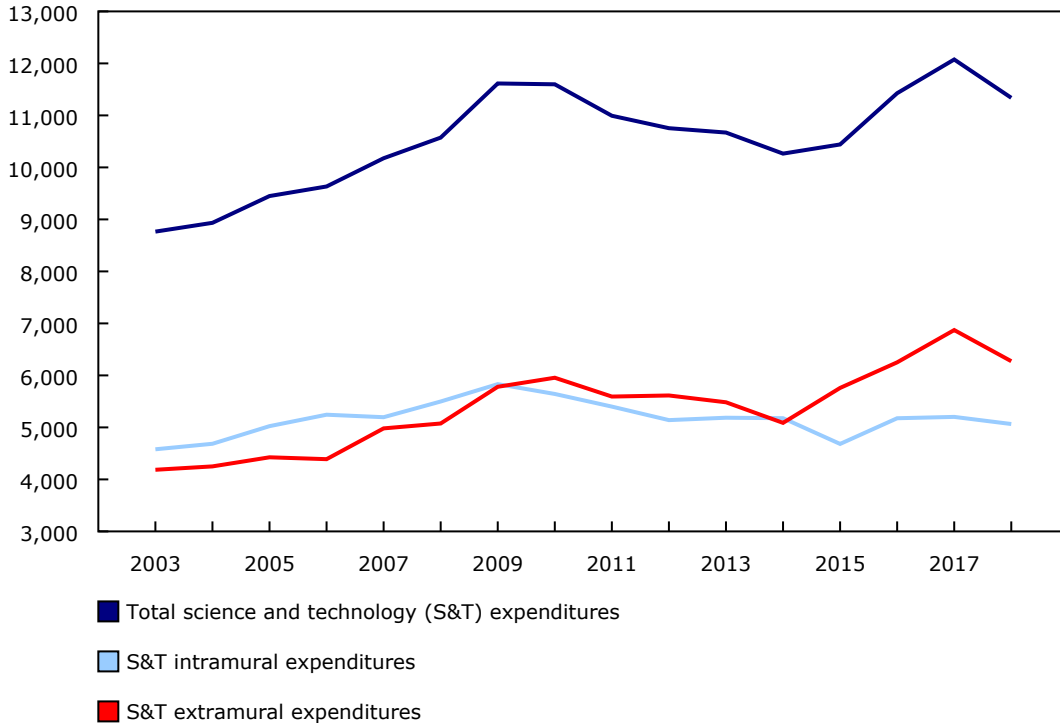
Federal government payments to external (or extramural) performers of S&T are expected to fall by 8.7% or \$600 million, to \$6.3 billion. Of the drop, 90% is expected to stem from declines in R&D spending, down \$538 million. Provincial and municipal governments are anticipated to be the most affected, with \$433 million less in federal government R&D grants and contributions in 2018/2019. In-house or intramural S&T expenditures, which are anticipated to make up just under 45% of total expenditures, are expected to fall by \$137 million (-2.6%) in 2018/2019, to \$5.1 billion.

Since 2007/2008, the three federal government organizations with the largest amounts in S&T spending have been the Natural Sciences and Engineering Research Council, National Research Council Canada, and the Canadian Institute of Health Research. In 2018/2019, these three organizations are expected to account for 30% of total S&T spending by federal departments and agencies and 46% of all R&D activity. The departments and agencies with the largest RSA spending include Environment and Climate Change Canada, Statistics Canada, and Health Canada, which together are anticipated to account for one-third of all RSA expenditures in 2018/2019.



**Chart 1**  
**Science and technology expenditures by performing sector (2003 to 2018)**

millions of dollars



Source(s): CANSIM table [358-0143](#).

### Slight decrease in federal personnel engaged in science and technology activities anticipated

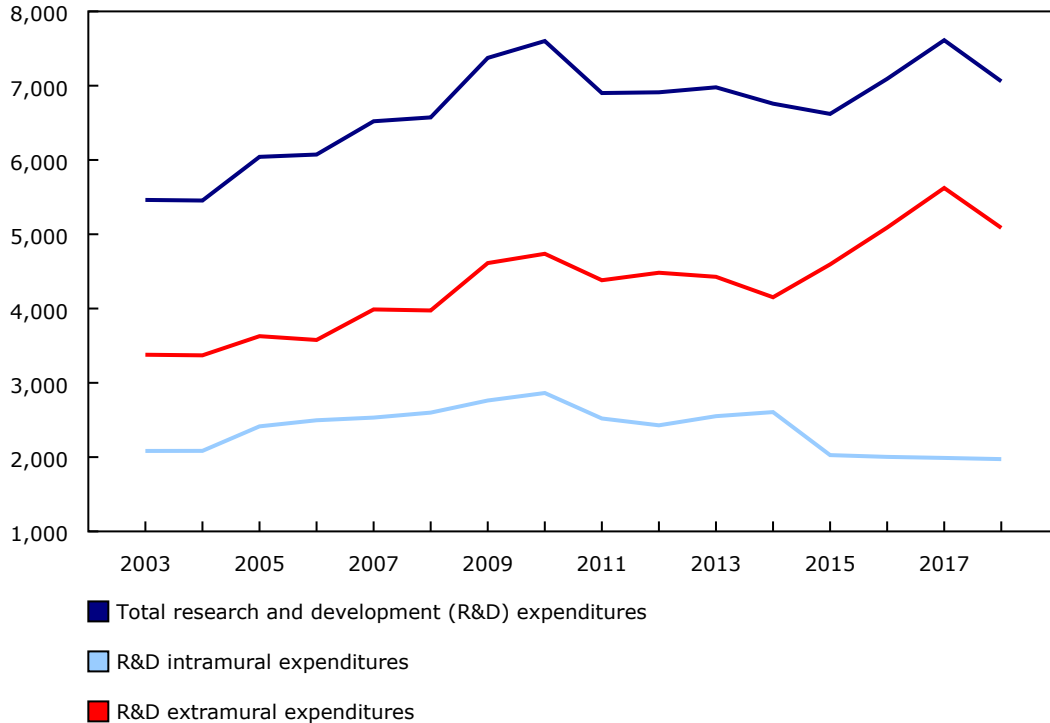
The anticipated decline in spending is expected to be reflected in fewer full-time equivalent (FTE) employees engaged in S&T activities in 2018/2019. Federal departments and agencies anticipate 34,484 FTE employees to be engaged in S&T activities in 2018/2019, down 0.8% from 2017/2018.

The largest decline is expected in the FTE category of 'Other' personnel, with a 2.8% decrease (-236 FTEs), to 8,164 FTEs, followed by 'Technical' personnel, which are expected to drop by 0.6% to 6,760 FTEs. The 'Scientific and professional' personnel are expected to remain essentially unchanged. The 'Scientific and professional' category historically holds the largest share of total S&T personnel and is expected to comprise 56.7% of total S&T personnel in 2018/2019.

It is anticipated that 80% of total S&T FTE personnel will be working for 16 major departments and agencies, namely those that contribute the most to total S&T expenditures. The three federal organizations with the highest personnel counts are expected to account for more than one-third (37.1%) of total S&T personnel. The top three are Statistics Canada, Environment and Climate Change Canada, and National Research Council Canada.

**Chart 2**  
**Research and development expenditures by performing sector (2003 to 2018)**

millions of dollars



Source(s): CANSIM table 358-0143.

### Science and technology spending increases by almost \$1 billion in 2016/2017

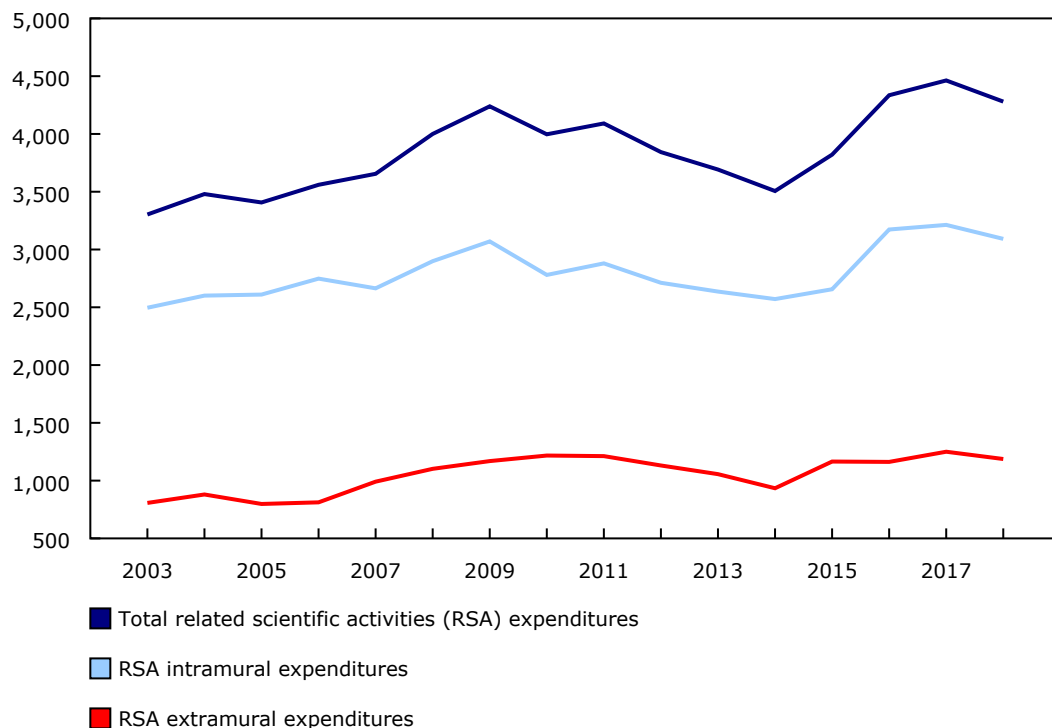
Fiscal year 2016/2017 saw the second largest year-over-year increase in federal S&T expenditures (+\$986 million), almost matching the largest annual increase of \$1.04 billion of 2009/2010. In 2016/2017, gains were observed in both R&D and RSA. R&D expenditures were up 7.1% or \$472 million, to \$7.1 billion, while RSA increased 13.5% or \$514 million, to \$4.3 billion from 2015/2016.

Extramural spending on R&D increased by \$495 million to \$5.1 billion and was marginally offset by a \$24 million decline in intramural spending to \$2.0 billion. The reverse was observed for RSA, with an in-house spending increase of \$517 million to \$3.2 billion, while payments to external performers remained largely unchanged.

Overall, extramural expenditures increased for all sectors except for 'Foreign performers', which saw a decline of \$39 million (a \$77 million decrease in RSA, offset by a \$38 million increase in R&D). The largest gains in federal funding were for R&D activities by the 'Provincial and municipal governments' (+\$245 million) and 'Higher education' (+\$180 million) sectors.

**Chart 3**  
**Related scientific activities expenditures by performing sector (2003 to 2018)**

millions of dollars



Source(s): CANSIM table 358-0143.

**Table 1**  
**Federal government spending on science and technology, by type of science**

	2015/2016	2016/2017	2017/2018	2018/2019	2017/2018 to 2018/2019
	millions of dollars				% change
<b>Total, science and technology</b>	<b>10 441</b>	<b>11,427</b>	<b>12,075</b>	<b>11,338</b>	<b>-6.1</b>
Research and development	6 620	7,092	7,612	7,059	-7.3
Related scientific activities	3 821	4,335	4,463	4,280	-4.1
<b>Natural sciences and engineering</b>	<b>7 930</b>	<b>8,641</b>	<b>9,369</b>	<b>8,725</b>	<b>-6.9</b>
Research and development	5 598	6,124	6,617	6,081	-8.1
Related scientific activities	2 332	2,517	2,752	2,644	-3.9
<b>Social sciences, humanities and the arts</b>	<b>2 511</b>	<b>2,786</b>	<b>2,706</b>	<b>2,613</b>	<b>-3.4</b>
Research and development	1 023	968	996	977	-1.9
Related scientific activities	1 488	1,818	1,711	1,636	-4.4

**Note(s):** Conceptual changes were implemented for the 2016/2017 survey cycle to account for non-program costs (indirect costs). The value of services provided without charge to the responding department by other federal government departments will not be added. As a result, data for 2010/2011 onward are not comparable with data for previous years.

Source(s): CANSIM table 358-0143.

**Table 2**  
**Federal government spending on science and technology, by performing sector**

	2015/2016	2016/2017	2017/2018	2018/2019	2017/2018 to 2018/2019
	millions of dollars				% change
<b>Total, all performing sectors</b>	<b>10,441</b>	<b>11,427</b>	<b>12,075</b>	<b>11,338</b>	<b>-6.1</b>
Federal government (intramural)	4,682	5,176	5,202	5,065	-2.6
Business enterprise	1,447	1,498	1,511	1,455	-3.7
Higher education	3,110	3,298	3,467	3,538	2.0
Canadian non-profit institutions	481	550	625	516	-17.4
Provincial and municipal governments	153	403	634	203	-68.0
Foreign performers	541	502	635	561	-11.7
Other Canadian performers	27	..	..	..	..

.. not available for a specific reference period

**Note(s):**

Conceptual changes were implemented for the 2016/2017 survey cycle to account for non-program costs (indirect costs). The value of services provided without charge to the responding department by other federal government departments will not be added. As a result, data for 2010/2011 onward are not comparable with data for previous years.

The extramural performer category of "Other Canadian Performers" has been removed from the questionnaire as of 2016/2017.

Source(s): CANSIM table [358-0143](#).

**Table 3**  
**Federal government personnel engaged in science and technology, by type of science**

	2015/2016	2016/2017	2017/2018	2018/2019	2017/2018 to 2018/2019
	full-time equivalent positions				% change
<b>Total personnel, all sciences</b>	<b>33,925</b>	<b>34,219</b>	<b>34,758</b>	<b>34,484</b>	<b>-0.8</b>
Scientific and professional personnel	18,989	18,879	19,556	19,560	0.0
Technical personnel	6,951	6,692	6,802	6,760	-0.6
Other personnel	7,985	8,649	8,400	8,164	-2.8
<b>Total personnel, natural sciences and engineering</b>	<b>23,410</b>	<b>23,348</b>	<b>23,955</b>	<b>23,903</b>	<b>-0.2</b>
Scientific and professional personnel	12,147	11,984	12,299	12,346	0.4
Technical personnel	5,971	5,819	5,974	5,948	-0.4
Other personnel	5,292	5,545	5,682	5,609	-1.3
<b>Total personnel, social sciences, humanities and the arts</b>	<b>10,514</b>	<b>10,872</b>	<b>10,804</b>	<b>10,582</b>	<b>-2.1</b>
Scientific and professional personnel	6,842	6,895	7,258	7,214	-0.6
Technical personnel	980	873	827	813	-1.7
Other personnel	2,692	3,104	2,719	2,555	-6.0

Source(s): CANSIM table [358-0147](#).

## Note to readers

The Federal Science Expenditures and Personnel survey, *Activities in the Social Sciences and Natural Sciences*, is an annual survey of all federal government departments and agencies that perform or fund science and technology activities. Actual data for 2016/2017, preliminary data for 2017/2018 and intentions for 2018/2019 were collected from August 15 to November 30, 2017 based on the federal government's fiscal year running from April 1 to March 31.

**Science and technology activities** comprise two types of scientific activities: research and development, and related scientific activities. It is defined as all systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of science and technology.

**Research and development** comprises creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

**Related scientific activities** are all systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technological knowledge.

**Natural sciences and engineering** consist of all disciplines concerned with understanding, exploring, developing or utilizing the natural world. Included are the engineering and technology, mathematical, computer and information sciences, physical sciences, medical and health science, and agricultural sciences, veterinary sciences and forestry.

**Social sciences, humanities and the arts** consists of disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as arts, economics and business, education, history and archeology, law, language and linguistics, media and communications, philosophy, ethics and religion, psychology and cognitive sciences, social and economic geography, and sociology.

**Full-time equivalent** is the personnel expressed as a ratio of working hours actually spent on scientific activities during a specific reference period divided by the total number of hours conventionally worked in the same period by an individual or a group. For example, an employee who is engaged in scientific activities for half a year has a full-time equivalence of 0.5

**Scientific and professional personnel** (also called Researchers) are professionals engaged in the conception or creation of new knowledge. They conduct research and improve or develop concepts, models and methods. Managers and administrators who plan and manage the scientific and technical aspects of a researcher's work, as well as graduate students, are also included.

**Technical personnel** perform scientific and technical tasks involving the application of concepts and operational methods in one or more fields of natural sciences and engineering or social sciences, humanities and the arts, normally under the supervision of researchers.

**Other personnel** (also noted as Support staff) includes skilled and unskilled craftsmen, and administrative, secretarial and clerical staff directly associated with R&D projects.

More information on the concepts and definitions of the survey (4212) is available from this release's Related information tab.

Available in CANSIM: tables [358-0142 to 358-0151](#) and [358-0163 to 358-0166](#).

Definitions, data sources and methods: survey number [4212](#).

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; [STATCAN.infostats-infostats.STATCAN@canada.ca](mailto:STATCAN.infostats-infostats.STATCAN@canada.ca)) or Media Relations (613-951-4636; [STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca](mailto:STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca)).