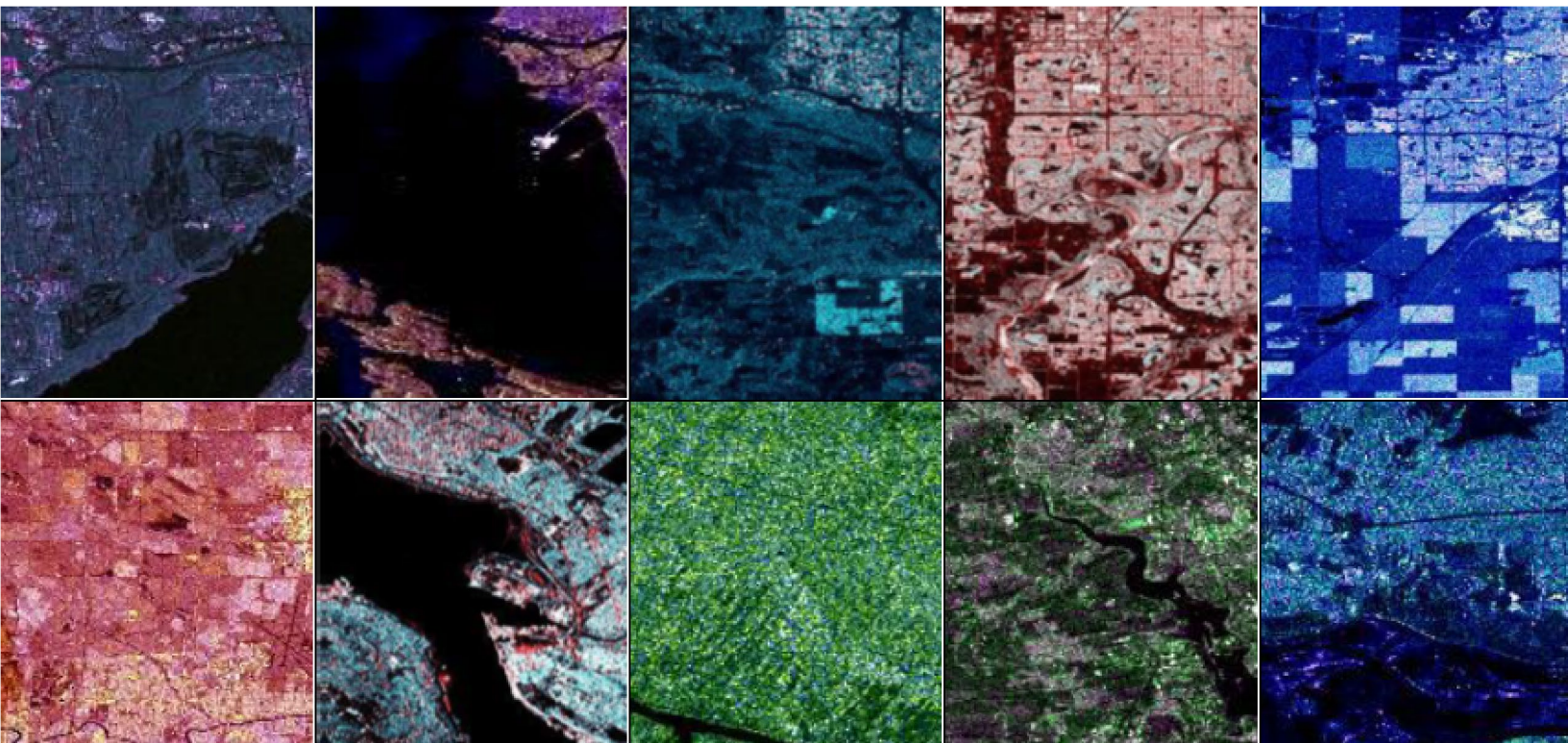




Evaluation of Space Data Utilization

For the Period of April 1st, 2020, through March 31st, 2024

Audit and Evaluation Directorate

February 2026



Canadian Space
Agency

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canadienne

Canada

Evaluation of Space Data Utilization

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Ce document est aussi disponible en français sous le titre « Évaluation de l'utilisation des données spatiales »

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Table of contents

Executive Summary	1
1. About the Evaluation	3
1.1. Purpose and Scope of the Evaluation	3
1.2. Methodology	3
1.3. Methodological Limitations	4
2. Program Description	4
2.1. Services Delivered and Supported by the Program	5
2.2. Program Financial and Human Resources	5
3.1. Alignment with Federal Priorities	7
3.2. Responsiveness to the Needs of Target Clienteles – Services to Canadians	8
3.3. Responsiveness to the Needs of Target Clienteles – CSA Service Inventory	9
3.3.1. Availability of and Access to Space Data	9
3.3.3. Capacity Development and User Support	13
3.3.4. Infrastructure Services	16
4. Effectiveness	16
4.1. Outputs Delivered	16
4.2. Immediate Outcomes Achieved	17
4.3. Intermediate Outcomes Achieved	19
4.4. Program Contribution to Departmental Objectives and Results (Ultimate Outcomes)	21
4.5. Performance Relative to the CSA Service Inventory	22
5. Efficiency	24
5.1. Strategic Role and Vision	25
5.2. Role in Supporting Data Utilization	25
Internal Roles and Responsibilities Related to Accountability	26
5.3. Role in Stakeholder Engagement	27
5.4. Optimization of Data Access and Openness Processes	28
5.4.1. Security of Sensitive Data: A Constraint on Optimal Use of Space Data	29
5.4.2. Optimization of RCM Data Acquisition and Accreditation Processes	30
Conclusion and Recommendations	31
Management Response and Action Plan	34

Frequently Asked Questions..... 35

Annexes 37

 Annex 1: Glossary..... 37

 Annex 2: Financial forecasts and actual expenditures by activity element (2020–2024) 42

 Annex 3: Open Data (2024)..... 43

 Annex 4: Innovative Initiatives 44

 Annex 5: References 46

 Annex 6: Abbreviations and Acronyms 47

Executive Summary

This report presents the results of the Evaluation of space data utilization, which examines the Space Utilization Program (SUP) of the Canadian Space Agency (CSA) for the period from April 1, 2020, to March 31, 2024. The evaluation focuses on the use of satellite data created and delivered by the SUP during this period, as well as related activities such as application development and services to Canadians. This is the second evaluation covering all areas of activity of the SUP. It also includes the “Application Development” initiative under the Space Capacity Development Program (SCDP), which encompasses expenditures related to the SmartEarth initiative.

The evaluation was conducted by the CSA’s Audit and Evaluation Directorate between March 2024 and December 2025. It was carried out in accordance with the CSA’s Departmental Evaluation Plan and the Treasury Board of Canada’s Policy on Results (2016). The evaluation addresses the main elements set out in the Directive on Results (2016), namely relevance, effectiveness, and efficiency. In response to information needs expressed by senior program management and the CSA, the evaluation also placed particular emphasis on data security and openness, as well as on relationships between the CSA and other levels of government.

Relevance

The program remains relevant and continues to respond to a demonstrable need in Canada. Its objectives and activities are aligned with federal priorities and responsibilities. It is a cornerstone of the CSA and holds strategic importance for several federal departments due to the satellite data it enables them to produce and access, as well as through its support to industry and the academic community. Demand for space data is increasing, and the user profile is becoming more diversified as awareness of the benefits of space data grows. The program has shown responsiveness to this evolving context and has demonstrated its capacity to adapt to emerging needs. However, access to satellite data and the ease of data use remain challenges for several stakeholders, despite the efforts undertaken by the program to address these issues.

Effectiveness

The program delivered the planned outputs and achieved the clear majority of its expected immediate and intermediate outcomes. While most targets were exceeded, some were not met due to various factors, such as procurement challenges and delays in the launch of the ROSEO Call for Proposals. With respect to the CSA Service Inventory, the program generally met its targets related to compliance with service standards. Lastly, it is clear that the program contributes to the achievement of departmental results, given the logical link between the different levels of outcomes and their attainment. However, it is currently not possible to determine, let alone assess, the degree of the program’s actual contribution to the CSA’s objectives and results, with the exception of the departmental indicator on services to Canadians, which is measured on a voluntary basis.

With regard to the CSA Service Inventory and the services delivered by the SUP, the program has established performance standards, collects the required data, and monitors performance. Key informants also

indicated that information is communicated to stakeholders in accordance with federal government requirements. However, there is a discrepancy between the results reported by the program to central agencies and the public information published on the government portal.

Efficiency

Overall, the program uses its human and financial resources appropriately to deliver outputs and achieve the expected results. Nevertheless, it operates in a context where demand for satellite data and the number and diversity of users is increasing rapidly, creating both opportunities and challenges for the SUP, particularly with respect to its role in the downstream sector.

During the period covered by the evaluation, the program demonstrated responsiveness to this evolving context and undertook several initiatives. It showed its ability to adapt to emerging needs through innovative initiatives such as SmartHarbour, SmartWhales, and the funding provided for the Indigenous application SIKU. In addition, it established an Earth Observation Coordination Office, undertook actions to enhance knowledge transfer and stakeholder engagement, developed a management framework to clarify its strategic and operational vision, and resumed the development of a centralized tool to collect, organize, and prioritize user needs over the longer term. However, further efforts are still required to optimize the use of resources and the implementation of the program. The program's efficiency could therefore be strengthened through clarification of its strategic role in the downstream sector, a clearer definition of its target clientele, the development of a stakeholder engagement strategy, and clarification of the respective mandates of the SUP and the SCDP with respect to capacity development.

The security of Earth observation (EO) data is both a technical and a strategic priority for the federal government, and the evaluation finds that the program is vigilant in this regard. While some internal key informants expressed reservations about opening EO data for security reasons, many others advocated for greater data openness. At present, there is no consensus among internal key informants regarding which EO data can or should be made public, due to the potential dual-use (civil and military) nature of certain EO data.

Recommendations

In light of the key findings outlined above, the evaluation makes the following recommendations to enhance the program's efficiency and ensure its continued relevance:

1. Clarify the strategic role of the SUP within the Canadian space ecosystem with respect to data utilization and application development, and in doing so, explicitly define the program's target clientele.
2. Clarify internal roles and responsibilities with respect to capacity development, stakeholder engagement and develop a stakeholder engagement strategy.

1. About the Evaluation

1.1. Purpose and Scope of the Evaluation

This report presents the findings of the evaluation of space data utilization, which examines the Space Utilization Program (SUP) of the Canadian Space Agency (CSA), in accordance with the CSA's Departmental Evaluation Plan and the Treasury Board of Canada's Policy on Results (2016). The evaluation addresses the core evaluation issues set out in the Directive on Results (2016), namely relevance, effectiveness, and efficiency. It is intended to be constructive in nature and to provide a neutral assessment based on evidence.

The evaluation was conducted by the CSA's Audit and Evaluation Directorate between March 2024 and December 2025. It examines the use of satellite data created and/or provided by the program, as well as related activities such as application development and services, for the period from April 1, 2020, to March 31, 2024. In response to information needs expressed by senior program management and the CSA, the evaluation also placed particular emphasis on data security, open data, and relationships between the CSA and other levels of government.

This evaluation is the second in a series of two successive, distinct but complementary evaluations of the CSA's SUP. It covers the activity elements "Data Utilization and Application Development" and "Observation Systems" (the latter being included insofar as it encompasses expenditures and activities related to data utilization). It also includes the "Application Development" initiative under the Space Capacity Development Program (SCDP), which includes expenditures related to the smartEarth initiative. Activities related to planning, preparatory work, and satellite mission development are excluded from the scope of this evaluation, as these elements were assessed as part of the 2023 evaluation of Observation Systems, Planning, and Preparatory Activities (OSPPA).

1.2. Methodology

The methodology included a review of several public and internal documents related to the SUP, a literature review of reports and studies relevant to understanding the program and its activities, internal data (including financial and performance data), 30 individual and group interviews with 35 CSA key informants¹, ad hoc consultations to further explore specific issues, and an external survey of stakeholders involved in satellite data utilization and application development. A total of 85 individuals responded to the external survey, representing the public sector (federal, provincial, and municipal), industry, the academic community, and not-for-profit organizations. The evaluation function also attended the third National Earth Observation Forum (May 2024), as well as several meetings of the Space Utilization Steering Committee (SUSC) and the Space Utilization Management Committee (SUMC) as an observer.

¹ The evaluation interviewed 18 key stakeholders from the Space Utilization Program (SUP) and 17 key stakeholders from other sectors, including senior management of the Canadian Space Agency (CSA).

1.3. Methodological Limitations

Scope of the evaluation. The decision to evaluate the full SUP through two separate evaluations was made in order to distribute effort and respond more quickly to decision-makers' information needs. Nevertheless, it remains difficult to entirely avoid addressing mission and initiative planning, preparation, and development within the scope of this evaluation (topics addressed in the OSPPA evaluation), given that these constitute prerequisite stages for data utilization. To mitigate this limitation, the evaluation considered certain aspects of planning, preparation, and mission and initiative development when relevant to the evaluation.

External survey response rate. The survey was conducted with 308 individuals from both space and non-space organizations. The response rate was 26%, which reduces representativeness and limits generalization. The mitigation strategy consisted of using complementary data sources, such as observational sessions and data collected by the program.

Performance data. The program adopted a new Performance Information Profile (PIP) in 2022–23, which affected the evaluation's capacity to analyze trends for certain indicators. Specifically, the methodology for some indicators was modified and new indicators were introduced as of that date.

2. Program Description

The Canadian Space Agency (CSA) comprises three main programs defined in the Program Inventory: the Space Capacity Development Program (SCDP), the Space Exploration Program (SEP), and the Space Utilization Program (SUP).

The SUP ensures that Canada fully benefits from the opportunities offered by space for the benefit of its citizens. It enables Canadian public-sector organizations, industry, and academia to access space-based data, information, and services to inform policy development and decision-making, strengthen the connection between Canada and Canadians, and enhance understanding of the Earth. More specifically, the program is responsible for implementing space solutions to create and/or provide satellite data in the fields of Earth observation (EO), space situational awareness (SSA), and satellite communications (SatCom), including scientific data (atmospheric, Earth system, and Sun–Earth system data).

The SUP carries out its mandate through two intervention mechanisms: transfer payments and support for programs and services delivered to Canadians. It is important to note that the SUP does not itself use the data and signals it helps to create, provide, and make accessible, as these data and signals are intended for use by other organizations delivering services to Canadians. In this way, the SUP supports the mandates of other entities that have a positive impact on Canadians. Space solutions assist the Government of Canada and the broader public sector in delivering services aligned with their mandates and national priorities, such as national security and disaster management, among others. "Services to Canadians," as defined in the CSA's Departmental Results Framework (DRF), refer to services delivered to the Canadian population by federal departments, academia, and industry. These should not be confused with the CSA Service Inventory.

The use of data by external stakeholders is the cornerstone of the SUP’s expected results, which explains why the program’s mandate is closely linked to that of other organizations, particularly other federal departments.

A detailed description of the program is available in the 2023 OSPPA evaluation report.

2.1. Services Delivered and Supported by the Program

The SUP is the largest contributor to the CSA Service Inventory. It delivers 14 distinct services and contributes to 4 additional CSA services, out of a total of 20 services in the inventory for 2023–24. Table 1 presents the services delivered specifically by the SUP within the CSA Service Inventory.

Figure 1. Service logic chain.



Table 1. The 14 services delivered specifically by the program.

Category	Service name
Data services (CSA satellites) / Data availability	Historical Earth observation data (RADARSAT-1)
	Earth observation data (RADARSAT Constellation Mission – RCM)
	Atmospheric gas monitoring data (SCISAT)
	Space imaging data for astronomy (NEOSSat)
	Space imaging data for space surveillance (NEOSSat)
Data access services	Earth observation data (RADARSAT-2)
	Space-based Automatic Identification System (AIS) data services
Data transformation services into usable products	Space surveillance analysis reports from the Collision Risk Assessment and Mitigation System (CRAMS)
	Atmospheric data on carbon monoxide concentration (MOPITT on Terra)
	Atmospheric data on ozone, aerosol, and nitrogen dioxide concentrations (OSIRIS on Odin)
	International Charter Space and Major Disasters
User services	Synthetic Aperture Radar (SAR) data user support – Service Desk
Infrastructure services	Geospatial observation base sites in remote regions of Canada (GO Canada sites)
	Ground support for space science (THEMIS)

2.2. Program Financial and Human Resources

Between 2020 and 2024, CSA expenditures related to data utilization and application development totaled approximately \$42 million. These expenditures include funding for salaries, management, operations and maintenance (O&M), contracts, grants, and contributions. This represents 18% of the total budget of the

SPACE DATA UTILIZATION EVALUATION

Space Utilization Branch for the period covered by the evaluation, with the vast majority of funding allocated to Observation Systems, Planning, and Preparatory Activities (OSPPA). In addition, no major investments in satellite communications (SatCom) were made during the evaluation period, except for a \$8,445 contribution to the SCanWisc 5G project in 2023–24. This support was primarily based on the expertise of certain telecommunications staff.

Table 2. Summary of financial expenditures by type of expenditure and fiscal year (2020–2024).

Set of activities	Activity elements	Type of expense	2020-21	2021-22	2022-23	2023-24	TOTAL
BLM 02-4 (SUP) Data utilization and application development	BLM 02-4-1 Data utilization and application development in Earth Observation ²	Salaries	\$1,160,195	\$1,100,313	\$1,137,041	\$1,349,808	\$24,506,009
		Operating expenses	\$2,220,489	\$3,443,817	\$2,282,893	\$2,886,195	
		Capital	\$0	\$0	\$0	\$0	
		Grants	\$1,743,581	\$1,922,043	\$1,922,165	\$1,337,469	
		Contributions	\$0	\$0	\$0	\$0	
		FTEs	\$8,45	\$10,02	\$10,4	\$12,6	
	BLM 02-4-2 Data utilization and application development*	Salaries	\$0	\$0	\$0	\$8,445	\$8,445
		Operating expenses	\$0	\$0	\$0	\$0	
		Capital	\$0	\$0	\$0	\$0	
		Grants	\$0	\$0	\$0	\$0	
		Contributions	\$0	\$0	\$0	\$0	
		FTEs	\$0	\$0	\$0	\$0	
	BLM 02-4-3 Data utilization and application development in Space Situational Awareness ³	Salaries	\$45,667	\$40,477	\$47,928	11,946	\$5,254,723
		Operating expenses	\$0	\$0	\$0	\$0	
		Capital	\$0	\$0	\$0	\$0	
		Grants	\$1,356,418	\$1,377,956	\$1,377,834	\$996,497	
		Contributions	\$0	0	\$0	\$0	
		FTEs	0,41	0,38	\$0,46	\$0,1	
BLM 03-5 (SCDP) Application development	BLM 03-5-1 Application development ⁴	Salaries	\$0	\$0	\$0	\$0	\$11,743,999
		Operating expenses	\$0	\$0	\$0	\$0	
		Capital	\$0	\$0	\$0	\$0	
		Grants	\$0	\$0	\$0	\$2,000,000	
		Contributions	1,389,798	4,181,884	4,473,098	\$1,699,219	
		FTEs	\$0	\$0	\$0		
Total Data utilization and application development			\$ 7,916,148	\$12,066,490	\$11,240,960	\$10,289,579	\$41,513,176
Total Space utilization			\$53,942,610	\$57,613,445	\$54,863,371	\$64,932,452	\$231,351,879

Note: Data provided by the CSA Finance team.

Expenditures related to data utilization and application development are being managed appropriately. Actual total expenditures in this area were lower than forecast over the years covered by the evaluation. Overall, the variance is approximately 15%, notably due to procurement challenges related to funding provided under the smartEarth initiative (Accelerator stream), as well as vacant positions (see Appendix 2).

It is important to note that there is a distinction between the Space Utilization Program (SUP) and the Space Utilization Branch, as the latter is not solely responsible for the SUP. More specifically, the CSA's Space Capacity Development Program (SCDP) is managed by the Space Science and Technology Branch and is composed of seven initiatives, including the "Application Development" initiative, which falls under the responsibility of the Space Utilization Branch. Financial resources coded under SCDP BLI 03-5-1 include grants and contributions awarded for application

2 smartEarth, IGOT, SCISAT, Earth system science, ROSS, RCM.

3 SSA, SWARM, ROSS, CRAMS.

4 Grants and Contributions of smartEarth.

development under the smartEarth initiative; according to key informants interviewed, this does not align with the strategic decision made between the SUP and the SCDP in this regard.

3. Relevance

General assessment. The program remains relevant and responds to a demonstrated need.

Satellite data represent a critical strategic asset that supports the economic and social well-being of Canadians by providing reliable, near-real-time information to support informed decision-making in key areas such as the environment, security, agriculture, and infrastructure. Satellite data make a significant contribution to scientific innovation and to the Government of Canada's capacity to deliver essential services to its citizens.

In recent years, Canada's downstream Earth observation (EO) data sector has undergone significant evolution. While historical efforts focused primarily on upstream activities, key informants identified a paradigm shift, noting that economic benefits and value creation opportunities now lie largely in the downstream sector, that is, in the use of space data and application development.

The Canadian EO Satellite Strategy, developed by the CSA in collaboration with Environment and Climate Change Canada (ECCC) and Natural Resources Canada (NRCan), reflects this perspective by emphasizing Canada's capacity to leverage national and international satellite data. The CSA has supported this direction by establishing partnerships with industry, academia, governments, and Indigenous communities. In this context, the SUP continues to invest in the infrastructure and technologies necessary to ensure the accessibility and quality of EO data, while supporting the development of new services and applications.

"Historically, the attention has been on the players upstream more than those downstream, because their activities were more visible in terms of results and national pride. However, with the passing of time, it has become evident that the investment multipliers and the growth potential are downstream. Leveraging data drives scientific discovery and commercialisation, sources of wealth and knowledge."

- Key internal informant

3.1. Alignment with Federal Priorities

Consistent with the findings of the 2023 OSPPA evaluation, the present evaluation finds that the SUP is strategically positioned to support several Government of Canada priorities. Over the period covered by the evaluation, the program continued to align its activities with federal priorities and departmental objectives through operational and in-development space missions and initiatives, such as the RADARSAT Constellation Mission (RCM) and the SmartWhales initiative, to name only a few. In 2024, the program also undertook an exercise to ensure alignment with the new Quality of Life Framework for Canada, identifying the components most relevant to its mandate across the "Prosperity," "Society," "Environment," and "Good Governance" pillars.

"Our government is proud to say that the Canadian Satellite-Based Earth Observation Strategy continues to deliver results and is driving a genuine surge in innovation in the Earth observation sector. The work of these Canadian companies that use satellite data to create innovative solutions will better equip us to protect our biodiversity, particularly in monitoring the environmental aspects of the expansion of the Port of Montreal."

- Minister of Innovation, Science and Industry of Canada
(2023)

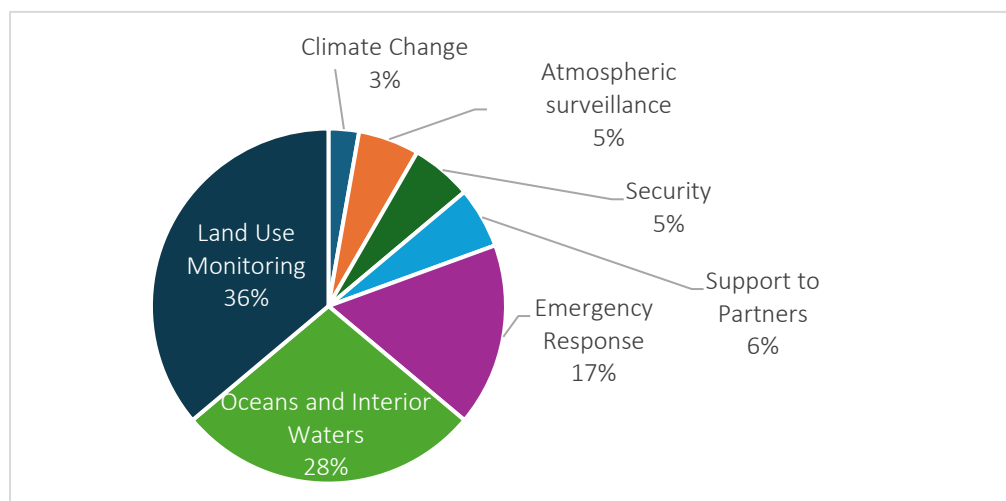
Moreover, the evaluation finds that the SUP remains aligned with the federal priorities of the government elected in April 2025. For example, in September 2025, the Prime Minister identified the expansion of the Port of Montréal at Contrecoeur as a project of national interest to be implemented rapidly to strengthen Canada’s independence, resilience, and security⁵. This project is currently supported by the SUP through the SmartHarbour initiative, which falls under smartEarth (see the section on “Responsiveness to Needs”).

3.2. Responsiveness to the Needs of Target Clienteles – Services to Canadians

The program continues to respond to a demonstrable need in Canada by providing essential data and services. Specifically, it works in collaboration with the public sector, the academic community, and industry to deliver services to Canadians using space data. SUP services are directly aligned with the CSA’s objectives set out in the Departmental Results Framework (DRF), particularly the departmental result “Space information and technologies improve the lives of Canadians,” which encompasses public- and private-sector services as well as datasets supported by the CSA.

In 2023–24, the SUP supported 37 services to Canadians, including 27 services delivered by seven federal departments and 10 services delivered by industry. For example, RCM space data support Environment and Climate Change Canada (ECCC) in diagnosing the structure of extratropical transition hurricanes, thereby contributing to disaster response related to hurricanes. Stakeholders also reported 20 services under development that will rely on the program’s space data during the 2023–24 fiscal year.

Figure 2. Distribution of operational services by domain (2023–24).



According to data collected by the CSA as part of the 2023–24 Survey on Services to Canadians, several clients reported having improved their services in recent years due to increased accessibility and quality of data provided by the CSA and the SUP⁶, as well as through automation and artificial intelligence.

⁵ Bellavance, J. D. (2025). Mark Carney unveils the first projects of national interest to relaunch the economy. La Presse, September 11, 2025.

<https://www.lapresse.ca/affaires/economie/2025-09-11/mark-carney-devoile-les-premiers-projets-d-interet-national-pour-relancer-l-economie.php>

⁶ This includes Sentinel (ESA) data.

Respondents also highlighted the support provided by SUP staff in addressing their needs, as well as the strong daily coverage of space data. However, challenges were identified, including limited data resolution, compatibility issues, access to RCM data, latency, time overruns, and insufficient data refinement for wildfire management needs.

3.3. Responsiveness to the Needs of Target Clienteles – CSA Service Inventory

Earth observation (EO) has become one of the CSA’s most significant activity areas since the launch of the RADARSAT-1 mission in 1995, and through RADARSAT-2, launched in 2007 and still operational, having exceeded its originally planned lifespan of 2015. In June 2019, the program enabled the CSA and Canada to make history with the launch of Canada’s first satellite constellation and the first mission owned and operated exclusively by the Government of Canada, the RADARSAT Constellation Mission (RCM). EO satellites provide data on oceans, ice, land surfaces, and the atmosphere and are used to monitor, protect, and understand the environment and the Earth, while helping to manage resources and ensure the safety of Canadians. The Canadian EO satellites currently supported by the CSA are the RCM, RADARSAT-2, and SCISAT. In addition, Canada contributes to international satellite missions (e.g., SWOT⁷).

The vast majority of services offered are free of charge, and clients can request access to services through five different methods.⁸ Online requests are by far the most common, a trend that has been particularly pronounced since 2021–22.

3.3.1. Availability of and Access to Space Data

During the period covered by the evaluation, the SUP provided five services free of charge to deliver space data from CSA satellites: historical RADARSAT-1 data (particularly useful for interannual comparative studies), RCM data, SCISAT data, and NEOSSat data, which are used, among other purposes, for space situational awareness (SSA). In addition, the program provided two data access services for RADARSAT-2 data (owned by industry) and the space-based Automatic Identification System (AIS). In 2017, the evaluation of the EO activity area had already found that transitioning from a privately owned satellite (RADARSAT-2) to a state-owned satellite (RCM) better enabled the CSA to meet the needs of government departments and agencies. Table 3 shows a slight increase over time in the number of requests submitted for RADARSAT-2 data.

Table 3. Number of requests received for SUP services

Category	Service Name	2020–21	2021–22	2022–23	2023–24
Data access service	Earth observation data (R2)	N/A	6,275	6,644	7,769

Note: The table above presents only services for which requests were received. Access to data from other services does not require requests.

Although the primary objective of the RCM is to meet the operational needs of federal departments, numerous stakeholders from other levels of government, academia, industry, and not-for-profit

7 NASA is responsible for the distribution of data for the SWOT mission.

8 Requests may be made online, by email, by mail, by telephone, or in person.

organizations, both in Canada and internationally, are interested in RCM data and wish to access it to meet their respective needs.

It should be noted, however, that only federal departments may submit RCM acquisition requests through the Standard Coverage Working Group. Public users subsequently have access to certain products below latitudes of 50 to 70 degrees (depending on longitude)⁹, but users must undergo an accreditation process to access all resolution types (excluding sensitive areas). On average, individuals take approximately 100 days to complete the security accreditation process, which is overseen by Global Affairs Canada pursuant to the Remote Sensing Space Systems Act (RSSSA). The time required varies among individuals, depending on their ability to respond promptly to information requests.

Since the launch of the RCM in 2019, 787 individuals have submitted requests for access to RCM data through the Earth Observation Data Management System (EODMS), administered by Natural Resources Canada (NRCan).¹⁰ Of these, 265 in Canada and 163 internationally were formally authorized, while 154 abandoned the process. Table 4 shows the distribution of users in Canada who completed the accreditation process and subsequently submitted data requests. Of the 265 individuals and/or organizations accredited in Canada, 157 (59%) submitted at least one request for RCM data (noting that clients may submit multiple requests).

Table 4. Number of authorized users who submitted an RCM data access request (2019–2025)

Category	Type of authorized user	Number of authorized users	Portion that submitted a request		Portion that did not submit a request	
Canada	Provincial governments	45	20	44 %	25	56 %
	Municipalities	1	1	100 %	0	0 %
	Universities	83	48	58 %	35	42 %
	Research centres	8	5	63 %	3	37 %
	Companies	110	68	62 %	42	38 %
	Not-for-profits	17	15	88 %	2	12 %
	Other	1	0	0 %	1	100 %
Total Canada		265	157 (59 %)		108 (41 %)	

Data collected through the external survey indicate that the absence of data provided by the program (across all data types) would have a significant impact on respondents' activities, a view shared by 77.7% of respondents, particularly in education, research and development (R&D), environmental monitoring, and

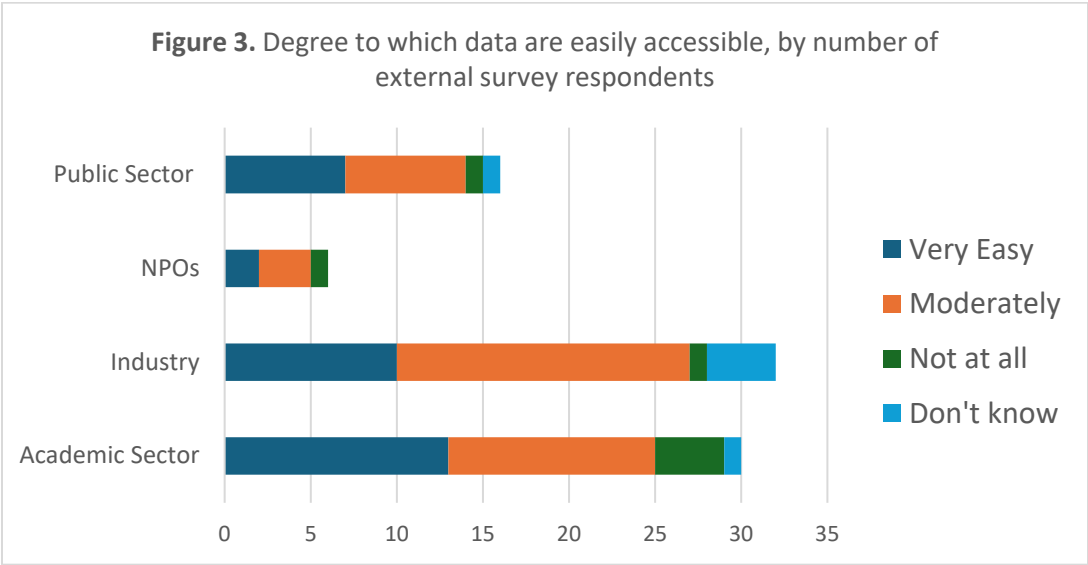
⁹ Public users have access to products covering the Canadian landmass and inland waters, the northeastern portion of Canada's Exclusive Economic Zone, as well as land areas of other countries, at a resolution of 16 metres or higher. They also have access to global ocean imagery products at a resolution of 100 metres, and to imagery products at a resolution of 50 metres or higher over western Greenland.

¹⁰ The Earth Observation Data Management System (EODMS) is a portal that enables users to discover and order Earth observation (EO) data. It was developed by Natural Resources Canada's Canada Centre for Mapping and Earth Observation (CCME), which administers and maintains the EODMS in accordance with the respective mandates of the Canadian Space Agency (CSA) and Natural Resources Canada (NRCan). A memorandum of understanding is in place between the CSA and CCME for this purpose. Accordingly, Space Utilization Program (SUP) funding is allocated to the operation of the space infrastructure associated with the EODMS.

the safety of Indigenous communities. These results confirm the program’s continued relevance and its central role within Canada’s Earth observation ecosystem.

However, 40% of respondents also indicated that satellite data provided by the CSA (or by other organizations and disseminated by the CSA) only moderately meet their needs. Access to satellite data, in particular, remains a challenge for many respondents, as illustrated in Figure 3.

Figure 3. Degree to which data are easily accessible, by number of external survey respondents.



The survey targeted a broad range of external respondents to provide an overall picture of the situation. However, it is important to note that ease of access to data varies depending on the type of user and the type of data. As such, users who are members of the Standard Coverage Working Group benefit from privileged access to RCM data, as they can submit acquisition requests based on their specific needs (see section 5.4.2). These users are not required to undergo the accreditation process. As noted previously, accredited users cannot submit acquisition requests but have access to a wider range of products, while public users have more limited access. In addition, users of scientific data benefit from a distinct access model, as most of these data are open, as shown in Appendix 3.

Accordingly, suggested improvements varied by respondent type. Non-governmental organizations frequently reiterated the need to be able to submit acquisition requests aligned with their needs and to standardize RCM acquisitions. However, such requests are not feasible given the mission design. Nevertheless, respondents from various groups expressed the view that it would be desirable to facilitate data downloading and provide access through a centralized open data platform. These responses are consistent with comments raised at the most recent National Earth Observation Forum (2024), where participants repeatedly highlighted ongoing challenges related to access to EO data, particularly with respect to centralized data repositories, user-friendly platforms, and download procedures. Several participants also indicated that the European Space Agency’s (ESA) Copernicus platforms and the United

States National Aeronautics and Space Administration’s (NASA) Landsat platforms represent best practices in this regard.

The main limiting factors related to data accessibility identified by internal key informants revolve around the existence of a legislative and regulatory framework that restricts access to data (e.g., Global Affairs Canada’s access policy), as well as the requirement to be an authorized user to access RCM data due to the sensitive nature of certain images captured (used in particular by National Defence). It should be noted that the Earth Observation Data Management System (EODMS) platform used to access RCM data is administered by Natural Resources Canada (NRCan). Some key informants also raised questions about NRCan being responsible for administering this platform rather than the CSA.

Overall, the program undertook several efforts to further increase data accessibility, such as simplifying the accreditation process for individuals and organizations applying for access to RCM data through the EODMS platform. These efforts are aligned with the CSA’s Data Strategy, in which it committed to improving data accessibility, quality, and service delivery.

3.3.2. Transformation of Data into Usable Products

Satellite data created and/or provided by the program are used both nationally and internationally. Among other things, the CSA contributes to international efforts in space situational awareness (SSA) and the sustainability of space activities. The CSA developed the Collision Risk Assessment and Mitigation System (CRAMS), which constitutes one of its services in the area of space debris management. CRAMS enables the assessment of collision risks between objects in orbit and various pieces of space debris and allows for the planning of avoidance manoeuvres when necessary. Canadian satellite operators rely on data from this system to respond quickly to potential threats, and satellite operators worldwide also make use of this service.¹¹ The number of close-approach notifications recorded by CRAMS has increased sharply in recent years, as illustrated in Figure 4. This increase is due to the significant growth in the number of satellites tracked by the system (from 78 in 2019–20 to 123 in 2022–23) and to the worsening congestion of the space environment resulting from large constellation deployments, which increase the number of conjunctions to be managed. In addition, changes were made to the database configuration to reduce the number of conjunctions handled, explaining the slight decrease observed in 2023–24.

Table 5. Number of CRAMS reports provided following a close-approach notification

Category	Service	2020–21	2021–22	2022–23	2023–24
Data transformation services	Space surveillance analysis reports (CRAMS)	10,983	19,843	248,038	195,001

Note: The table above presents only services for which requests were received. Access to other services does not require requests.

In a similar vein, the CSA is a founding member of the International Charter “Space and Major Disasters,” under which member space agencies cooperate voluntarily 24 hours a day and without compensation to help mitigate the effects of disasters worldwide. Ground response teams rely on RCM imagery to save lives and limit damage. This service is provided free of charge to users. For example, Public Safety Canada (the

¹¹ Canadian Space Agency (CSA). (2024). Canada and the sustainability of space activities. September 6, 2024. <https://www.asc-csa.gc.ca/eng/sustainability/canada-and-space-sustainability.asp>

only entity authorized to activate the Charter in Canada) activated it when Hurricane Fiona, a Category 4 storm, struck Canada on September 24, 2023. RCM data were also used to support rescue operations when the Charter was activated in 2023 to assist Somali authorities during severe flooding caused by a three-month rainy season. Between 2020 and 2024, Canada responded to between 47 and 51 Charter activations annually.

In addition, the Canadian instrument OSIRIS (Optical Spectrograph and InfraRed Imager System) is the optical payload aboard the Swedish satellite Odin, launched in February 2001. Data provided by OSIRIS help scientists better understand the impacts of human activities and natural phenomena on climate and the environment. The instrument focuses primarily on atmospheric layers between altitudes of 7 km and 90 km-between the highest mountains and the beginning of space- to measure concentrations of ozone, aerosols, and nitrogen dioxide.¹² There is also NASA’s Terra mission, conducted in collaboration with the CSA and the Japan Aerospace Exploration Agency (JAXA). The satellite includes the Canadian Measurement of Pollution in the Troposphere (MOPITT) instrument. Launched in 1999, MOPITT represents the longest-running space-based air quality measurement mission and the longest continuous space mission in Canadian history.¹³ The instrument was decommissioned by NASA in April 2025 due to insufficient satellite power resources. Currently, the CSA provides a service to process these data to a higher level to make them more easily usable for researchers.

3.3.3. Capacity Development and User Support

Between 2020 and 2024, the program received a growing number of requests for support and guidance related to the use of synthetic aperture radar (SAR) data, primarily involving RCM data launched in June 2019 and operational since November 2019.

Table 6. Number of requests received for the SAR data user support service (Service Desk)

Category	Service	2020–21	2021–22	2022–23	2023–24
User services	Service desk – SAR data user support	N/A	829	2,403	2,722

Note: The table above presents only services for which requests were received. Access to other services does not require requests.

In 2016, the evaluation of the EO activity area recommended that EO-related application development initiatives be reviewed to consider the full range of Canadian EO stakeholders and respond to their needs by providing access to a variety of EO data, including data from foreign satellites. It also recommended improving program design and funding options to strengthen the capabilities of departmental EO data users and to foster the development of a competitive downstream EO industry. In this context, the SUP developed an application development–focused initiative called smartEarth in 2019, which consolidates the CSA’s capacity development resources to enable Canadians to make the most of space data, with a primary emphasis on the convergence of remote sensing, space-based geolocation, and digital technologies. In doing so, smartEarth establishes collaborations and partnerships across all three orders of government and

¹² Canadian Space Agency (CSA). (2017). ODIN. December 5, 2017. <https://www.asc-csa.gc.ca/eng/satellites/odin.asp>

¹³ Canadian Space Agency (CSA). (2025). MOPITT. May 26, 2025. <https://www.asc-csa.gc.ca/eng/satellites/mopitt.asp>

consolidates human and financial resources previously allocated to the Earth Observation Application Development Program (EOADP), the Earth Observation Government Initiatives Program (EOGIP), and the RADARSAT Scientific and Operational Applications (SOAR) initiative.

During the evaluation period, the program also developed various funding opportunities to support the academic sector and to promote and expand application development and space data utilization in Canada. For example, the Call for Proposals (CFP) “Research Opportunities in Satellite Earth Observation” (ROSEO), published from October to November 2023 under the smartEarth initiative and the broader Grants and Contributions Program, aims to support Canadian universities and postsecondary institutions conducting satellite EO application development projects by providing grants of up to \$312,500 over three years. ROSEO responded directly to needs identified at the 2022 National EO Forum, where academic representatives emphasized the need for increased support in the downstream EO sector.

In total, the program awarded \$5 million in grants to the academic sector in 2023–24 under ROSEO to support research in satellite EO. More specifically, it provided financial support to 13 universities and 17 research projects involving 144 highly qualified personnel (HQP) and 69 students.

The SUP continues to support the Canadian academic community in space data utilization and application development through other CFPs and activities. For example, the CFP “Research and Opportunities in Space Science 2022–27” (ROSS), in effect since November 10, 2022, provides grants to postsecondary institutions for research projects aligned with spatial data priorities in atmospheric science, Earth system science, and Sun–Earth system science. The maximum annual funding per grant agreement for an eligible recipient is \$75,000 per year, up to a total of \$225,000.

As with accessibility, the program has made significant efforts in recent years to facilitate the use of satellite data and application development. Nevertheless, opportunities for improvement remain to better meet user needs. Among external survey respondents who indicated using satellite data, 64% consider these data to be easy to use. While encouraging, this result also highlights opportunities for improvement. The most frequently cited suggestions for enhancing the user experience include providing analysis-ready data, improving data interoperability (through adoption of standardized, internationally compliant formats to facilitate integration with other datasets and tools), creating a single access point aggregating multiple data sources, and modernizing platforms, including application programming interfaces (APIs) and visualization and analysis tools.

Managing large volumes of data was also identified as an additional challenge for client groups with limited computing resources, such as Indigenous communities or those living in remote regions. Cloud platforms were identified as a promising solution to improve access to data and promote more equitable use across the country. Digital Earth Canada (DEC), Canada’s EO data exploitation platform currently in the ideation phase, was frequently cited as a way to address many of these needs while also facilitating data use. Indeed, similar platforms developed by five countries or international groupings have demonstrated their effectiveness in increasing the use and utility of EO data across various actors and sectors of the economy, according to the *Measuring DEC’s Socio-economic Benefits* analysis. The program invested \$1.4 million between 2022 and 2024 in the development of this platform. These findings are echoed in interviews with internal key informants and in feedback from participants at the 2024 National EO Forum, who highlighted

DEC as an example of how integrated data systems could help transform satellite data into actionable information for decision-making.

In addition, internal key informants noted that direct capacity-building support to federal departments declined following the end of the EOGIP program in 2019, which had been specifically oriented toward supporting other federal departments. Funding provided under the smartEarth initiative is more strongly oriented toward industry and academia. According to key informants, this situation may hinder the long-term strengthening of skills related to the use and reuse of space data within federal departments, which nonetheless remain the program's primary target clientele. The evaluation also observed stagnation in the number of departments using space data, at least regarding RCM data. Seventeen departments expressed an interest in using satellite data during consultations leading to the EO Satellite Strategy, yet the number of departments using such data on a regular basis declined from 16 in 2020 to 14 in 2024. Some staff believe that untapped potential exists to strengthen engagement with departments that use space data minimally or not at all, in order to better understand their needs and barriers to use.

"Numerous departments have significant untapped potential for reusing our data."

- Key internal informant

At the most recent National EO Forum in 2024, participants also highlighted the importance of strengthening user capacity to work with satellite data. The development of new tools and training was identified as a priority to support the continued growth in demand for EO data, particularly SAR data. In one session, 38% of participants expressed a desire for data to become more accessible and easier to use, while 29% emphasized the need for better integration with other platforms and data sources. In terms of skills development, 35% of respondents expressed interest in online courses and webinars, and 31% in hands-on workshops and tutorials.

Growing Needs

Consistent with the findings of the 2023 OSPPE evaluation, the evaluation observes that the demand for space data is growing across Canada, including among groups not traditionally targeted by the program, as users become increasingly aware of the benefits of space data for their respective mandates, priorities, and objectives. In addition to growing demand within federal departments, provincial governments, municipal administrations, territorial governments, and Indigenous communities are also demonstrating increased interest in EO data due to their usefulness in urban planning, emergency and disaster management (e.g., flooding), and environmental monitoring (e.g., air and water quality and ecosystem health), among other applications. In 2023, for example, the Government of Alberta developed province-wide dead-tree detection capacity using satellite imagery and artificial intelligence. The use of satellite data is also increasing within Indigenous populations and plays a critical role for certain groups that use it to ensure safe travel on ice.

"As Canadian cities and communities continue to grow, an increasing number of users are seeking to take advantage of the unique opportunities offered by satellite-based Earth observation. Federal departments and agencies will work collaboratively to develop satellite-based Earth observation applications for new users."

- Earth Observation
Strategy, 2022

During the period covered by the evaluation, the program demonstrated responsiveness to this emerging reality and its ability to adapt to evolving needs, notably through initiatives such as SmartHarbour, SmartWhales, and funding provided for the Indigenous application SIKU (see Appendix 4).

3.3.4. Infrastructure Services

In April 2023, the CSA launched the Call for Proposals (CFP) “Geospatial Observatory (GO) Canada 2023–2029”, aimed at supporting research projects designed to observe and better understand the Earth, particularly Sun–Earth interactions. Through this CFP, the CSA funds the collection, processing, and open dissemination of scientific data generated by ground-based instrument networks, contributing to the mitigation of space weather impacts on the daily lives of Canadians and supporting national and international space missions. The service provided by the SUP in this context consists of hosting scientific instruments at GO Canada sites, thereby ensuring an appropriate operating environment for these instruments.

THEMIS is a NASA-led scientific mission bringing together researchers from the United States, Canada, and several European countries. In Canada, activities related to this mission are funded by the CSA and involve researchers and stakeholders from multiple academic institutions. The service provided by the SUP includes support for ground infrastructure for the THEMIS mission, particularly to leverage Canada’s strategically advantageous geographic location.

4. Effectiveness

General assessment. Overall, the program generally delivered the expected outputs and achieved the clear majority of its anticipated immediate and intermediate outcomes. However, it remains difficult to determine and assess the extent of the program’s actual contribution to departmental results.

In accordance with the Directive on Results (2016), the evaluation found that the majority of performance data for the program were accessible, reliable, and relevant to support the evaluation process. It should be noted that during the evaluation period, the program updated its Performance Information Profile (PIP) in March 2022, which affected the evaluation’s ability to analyze trends for certain indicators. As a result, the evaluation used the second edition of the PIP as the baseline for assessing effectiveness. In this second PIP, expected result *OC7 (R&D in the space utilization domain is increased)* does not have an associated performance indicator. In addition, it is difficult to establish direct links between the SUP and the expected results under the Departmental Results Framework (DRF), as only one outcome, namely, the number of services to Canadians, is tracked by the program. It should also be noted that a third PIP was developed in March 2024 and that changes to the financial coding of activities were implemented in 2025 to improve the ability to more precisely link activity funding to outputs and associated results.

4.1. Outputs Delivered

Contracts, grants, and contributions provide opportunities in science and R&D (OP3)

The number of contracts¹⁴, grants, and contributions is the primary lever available to the SUP to achieve results in terms of space sector growth, technology and application development, and advancement of scientific knowledge. As such, variations in SUP results are closely linked to variations in the number of agreements established during a given period. In 2022–23, 84 scientific studies, R&D projects, or demonstration projects were funded, with 70 completed against a target of 80. In 2023–24, the program funded 77 studies and projects but did not meet its target of 93 due to delays in the launch of the ROSEO CFP (see section ‘Efficiency’). Results have been measured in this manner since the second PIP in 2022.

Space infrastructure managed by the SUP is operational (OP4)

Some satellites are operated directly by the CSA. As such, the CSA is responsible for ensuring their operational performance by measuring the percentage of CSA-operated missions that meet availability requirements. From 2020 to 2024, 100% of satellites met their availability requirements.

4.2. Immediate Outcomes Achieved

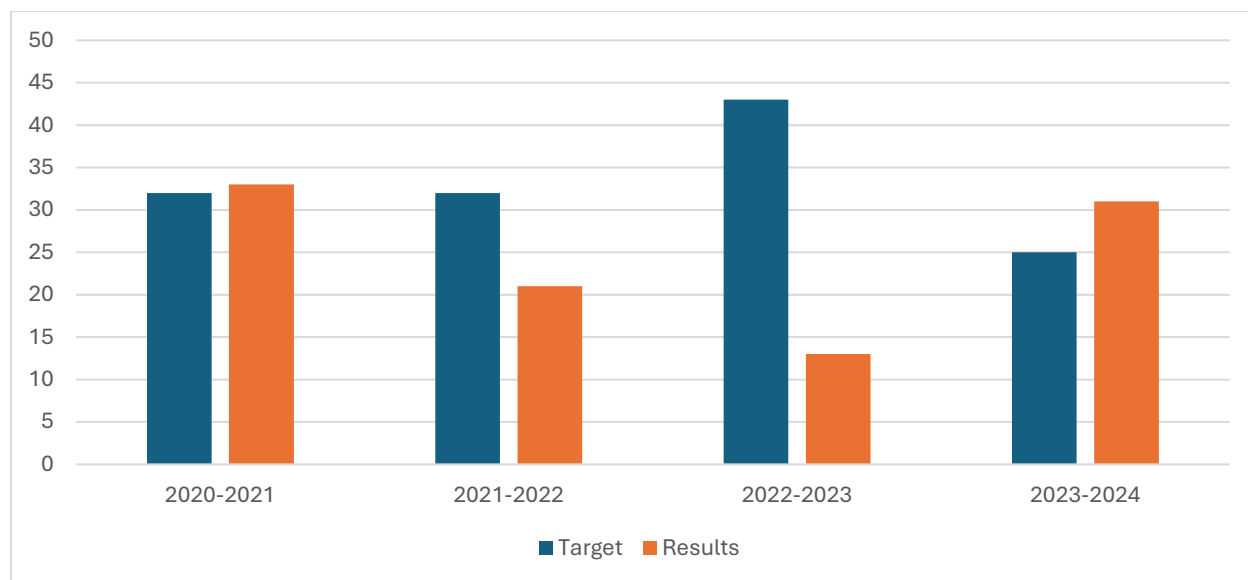
SUP initiatives support a diverse workforce contributing to advances in science, technology, and applications in Canada’s space sector (OC2)

The number of technologies and applications that advanced in their Technology Readiness Level (TRL) and Application Readiness Level (ARL) as a result of SUP support is directly linked to smartEarth projects. The program exceeded its targets in fiscal years 2020–21 and 2023–24, but not in 2021–22 and particularly 2022–23. According to key informants, the gaps observed in those fiscal years were due to procurement issues that caused delays and prevented the implementation of planned projects under the smartEarth Accelerator stream.

In addition, 555 Highly Qualified Personnel (HQP) worked on funded projects in 2022–23. This number increased to 620 HQP in 2023–24, as teams were larger on average despite a lower number of agreements. Program targets were significantly exceeded in both years (475 HQP in 2022–23 and 582 HQP in 2023–24). As an indirect benefit, approximately 200 students per year participate in program initiatives.

Figure 4. Number of technologies and applications that advanced their TRL or ARL with SUP support.

¹⁴ During the period covered by the evaluation, R&D contracts were included in the performance measure for this output. They were removed from the methodology starting in the 2023–24 fiscal year to improve alignment between the Space Utilization Program (SUP) and other CSA programs.



Canada's space sector expertise is demonstrated through initiatives and space missions (OC3)

Through its international collaborations, the CSA plays an important role in the sharing and use of satellite data. Its active participation in the International Charter "Space and Major Disasters", in which between 80% and 82% of Charter activations were supported by CSA imagery between 2022 and 2024, illustrates its commitment to international assistance. At the same time, the Collision Risk Assessment and Mitigation System (CRAMS) demonstrates the CSA's involvement in managing space debris risks. The number of domestic and foreign satellites supported by CRAMS has remained at 123 satellites since 2022, exceeding targets for both fiscal years (72 in 2022–23 and 100 in 2023–24).

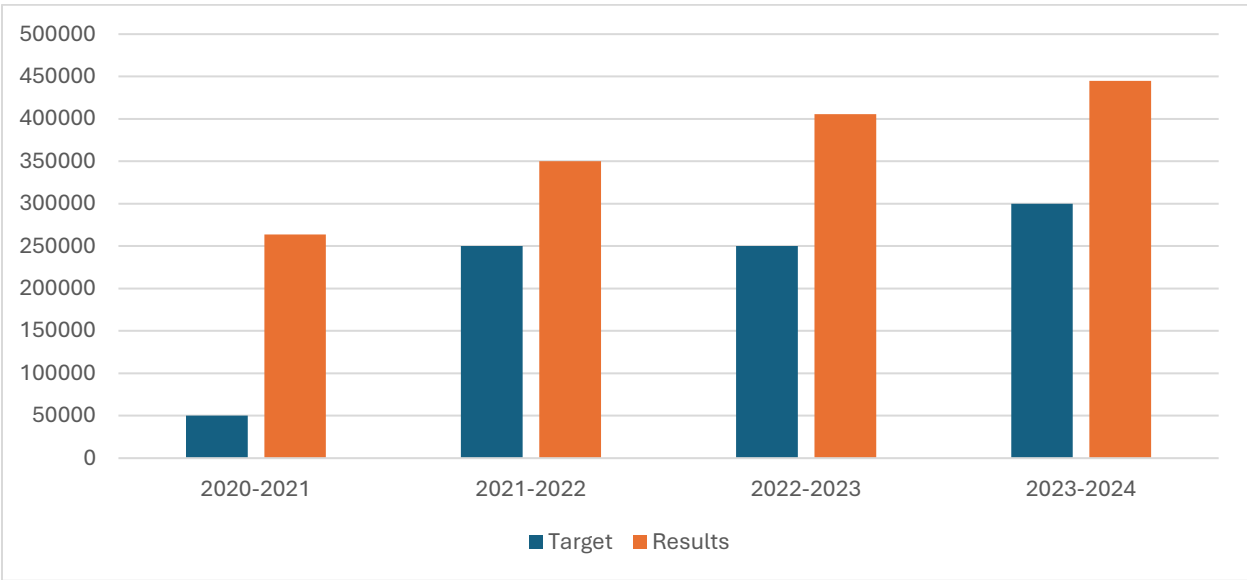
In addition, the number of space missions containing Canadian content¹⁵ enabled by the SUP declined from 19 to 10 in 2023–24. This change is due to a methodological update and more rigorous data validation to remove Canadian contributions that are no longer operational or that fall under the CSA's contribution program to the European Space Agency (ESA).

Space data and signals are accessible and usable by the public, private, and academic sectors (OC4)

Space data and signals are accessible, and the data acquisition team has made significant efforts to improve efficiency. The number of acquisitions from Synthetic Aperture Radar (SAR) satellites supported by the SUP has increased over time. The RCM exceeded its initial target of 250,000 images in 2021–22, because of improved coordination of requests to address multiple needs simultaneously. This trend has continued in 2022–23 and 2023–24, as shown in Figure 5. The total number of images also reflects a decline in RADARSAT-2 requests in favour of the RCM (from 19,465 in 2020 to 9,276 in 2024).

¹⁵ An example of a space mission containing Canadian content is the Canadian Space Agency's contribution to the Surface Water and Ocean Topography (SWOT) mission, carried out in partnership with NASA and the UK Space Agency, which enables the observation of approximately 90% of the Earth's surface waters.

Figure 5. Number of images acquired from CSA SAR satellites per year (2020–2024).



Another indicator is the number of datasets/signals made accessible with SUP support. In 2022–23, the SUP met its target by making 19 databases available. In 2023–24, 21 databases were made available against a target of 21. Methodological changes were introduced in 2023–24, including the removal of ESA datasets and the addition of instruments supported by GO Canada. Approximately 135 datasets or signals produced by organizations and other departments supported by the SUP have been used annually since 2022. As this indicator has only been tracked since 2022–23, the target of 100 is conservative; however, performance has remained stable.

Although satellite communications are identified as a space solution supported by the program in the PIP, no performance indicator is associated with this activity and no concrete actions were identified in this area. This raises questions regarding the program’s alignment with its stated objectives and the clarity of its strategic positioning in satellite communications.

4.3. Intermediate Outcomes Achieved

SUP partners are informed, engaged, and developing (OC5)

This objective was revised in 2022 as part of the second edition of the PIP. Initially, the indicator tracked the number of organizations with which partnerships¹⁶ were created and maintained. In 2020–21, the program created and maintained partnerships with 123 organizations, exceeding its target of 109. Although this number increased to 170 organizations in 2021–22, the program did not meet its target of 200. Key informants cited the end of the IGOT program and procurement delays under smartEarth as

¹⁶ It should be noted that the term “partnerships” is used by the program to report on its results, in accordance with its official Performance Information Profile (PIP), but is not intended to be interpreted in the legal sense of the term.

factors explaining this shortfall. Following the revision of the PIP objective, the indicator was updated to better align with other CSA programs (i.e., the number of Canadian organizations participating in SUP-funded projects). In 2022–23, performance reached 189 organizations against a target of 178, and 202 organizations against a target of 222 in 2023–24. The gap is attributable to a higher concentration of partner organizations within projects. Notably, no indicator exists to measure the level of information sharing or engagement itself, raising questions about the program’s strategic positioning with respect to this objective.

Knowledge of the Earth and its space environment is enhanced (OC6)

Between 2022 and 2024, 278 peer-reviewed scientific publications (target: 276) were enabled through SUP funding, and 176 peer-reviewed publications (target: 90) acknowledged CSA funding in relation to activities, projects, or missions supported by the SUP. In 2022–23, indicators related to this outcome were revised to better reflect the program’s contribution. The performance measurement team is also reviewing the methodology to incorporate bibliometric studies, with the goal of producing a more accurate and comparable long-term picture.

R&D in the space utilization domain is increased (OC7)

Despite the absence of a performance indicator for this expected outcome, the evaluation concludes that the program has contributed to increased space R&D by supporting a range of scientific and technological initiatives. External survey respondents noted that the program has:

- Supported the development of an early warning tool using SAR data to identify abnormal movements in satellite-monitored bridges
- Supported targeted RCM data acquisitions for applications detecting feeding areas and the presence of North Atlantic right whales, contributing to species protection and maritime activity management
- Enabled testing of broadcast target networks in urban areas, demonstrating the feasibility of certain satellite applications in complex environments through academic projects

These examples illustrate the SUP’s role in strengthening R&D capacity in academic and governmental settings while fostering innovation in space data use. However, as noted earlier, the evaluation cannot determine the precise degree of R&D advancement, as no indicator or performance target is associated with this outcome for the SUP. Each expected outcome should be supported by a performance indicator to demonstrate real impact and ensure appropriate accountability. Key informants noted that while such an indicator exists at the CSA level, it has been attributed to the SCDP due to its program objectives.

Public organizations act as catalysts for the use of space data (OC8)

One of the program’s primary roles is to provide satellite data to federal departments in support of services to Canadians. This role expands opportunities for space data use across government. The target of 17 departments using space data was not met, as this figure was based on the number of departments that expressed interest during consultations leading to the EO Satellite Strategy. The number of departments using space data declined from 16 in 2021–22 to 15 in 2022–23, stabilizing at 14 in 2023–24.

These variations reflect episodic departmental data needs. As a result, 14 federal departments currently use space data actively in their operations.

4.4. Program Contribution to Departmental Objectives and Results (Ultimate Outcomes)

Overall, the program's logic model and achievement of immediate and intermediate outcomes indicate that the program contributes to departmental results through the logical linkage among outcome levels. In addition, the program contributes directly to one of the CSA's Departmental Results Framework (DRF) indicators: the number of services to Canadians that depend on information provided by space data, one of the two indicators associated with the departmental result "Space information and technologies improve the lives of Canadians."

The departmental indicator is a combined calculation of services provided by the Government of Canada that use satellite data whose availability has been supported by the CSA (stream 1), commercialized applications whose development has been supported by the CSA (stream 2), and spatial databases made available to researchers and the public (stream 3). The breakdown of the indicator's result for the program is measured and has been tracked on an annual basis since 2019. It is a central indicator in demonstrating the results of program activities and in justifying future investments and projects, as it provides a direct link between EO data and benefits for Canadians.

Over time, the methodology has evolved to improve performance data quality. For example, data collection was brought in-house rather than outsourced, improving understanding and capture of services. Additional contextual information has improved precision by identifying data types used for each service and distinguishing operational services from those under development. However, methodological changes have also reduced the total number of services attributed to the SUP (excluding stream 3) and complicated year-to-year comparisons. Data collection during the evaluation period relied primarily on partner self-reporting, and response rates may influence results.

Table 7. Number of services to Canadians that depend on space information supported by the SUP.

	2020-21	2021-22	2022-23	2023-24
Streams 1-2	44	36*	34	37
Stream 3	18	19	19	20**
Total	62	55	53	57

*The integration of industry in the data collection helped mitigate the impact of the methodological change on the results.

**As noted in the Efficiency section, 21 databases were made available in 2023-2024, against a program target of 21 (OC4). However, since the CMR does not include GO Canada, resulting in a total of 20.

The evaluation finds it difficult to determine and assess the SUP's actual degree of contribution to CSA departmental objectives and results. While the CSA collects extensive performance data through surveys and consultations, current data do not allow direct attribution of SUP activities and results to all departmental outcomes.

Table 8. SUP Contribution to the CSA Departmental Results Framework (in effect since 2024).

Objectives and Departmental	Departmental Indicators	Target (2023-24)	Result (2023-24)	SUP Breakdown
Departmental Result #1 Canada remains a leader in space	Ranking of Canada among OECD countries based on the citation score of space-related publications	13	21	Data unavailable
	Ranking of Canadian government's civil space budget by share of GDP among OECD and BRIC countries	25	21	Data unavailable
Departmental Result #2 Space-related information and technologies improve the lives of Canadians	Number of Canadian space technologies adapted for use on Earth or reuse in space ¹⁷	34	31	Data unavailable
	Number of services offered to Canadians that rely on information provided by the CSA's space data ¹⁸	111	107	57
Departmental Result #3 Canada's investments in space provides benefits for the Canadian economy	Value of the Gross Domestic Product (GDP) of the Canadian space sector	\$2.7B	\$3.2B	Data unavailable
	Number of employees in the Canadian space sector	11,500	12,624	Data unavailable

Note: Data relative to targets and results were drawn from the 2023-2024 Departmental Results Report. Specific data for SUP (column 'SUP Breakdown') are provided by SUP.

In addition, the evaluation finds that frequent methodological changes to the *Services to Canadians* indicator, combined with ambiguity around the definition of "service," have created confusion within both the SUP and the CSA.

4.5. Performance Relative to the CSA Service Inventory

The Directive on Service and Digital, which came into effect on April 1, 2020, requires departments to develop and update annually a departmental service inventory, establish and manage service standards and related targets, monitor performance information for all services and delivery channels, and ensure that real-time performance information is publicly available via departmental websites.¹⁹ Similarly, the InfoBase platform states that service standards measure government performance, enhance accountability, and help clients understand what to expect when accessing services.

The program has established performance standards, collects the required data, and monitors performance. Key informants also confirmed that information is communicated to stakeholders in accordance with federal requirements. However, platforms used to disseminate service performance

¹⁷ With respect to bibliometrics, the fields of "Atmospheric Sciences," "Earth Surface Sciences," and "Sun-Earth Sciences" cover the program's activities, although they are not included in its Performance Information Profile (PIP). Since fiscal year 2023–24, data have been collected and analyzed by the CSA Library team, a responsibility that was previously assigned to external consultants, resulting in methodological changes.

¹⁸ All results stem from the use of satellite data. However, it is important to note that space data originating from European Space Agency (ESA) satellites are included in the reported results. As a result, not all services counted for this indicator derive exclusively (although largely) from satellites and instruments supported by the Space Utilization Program (SUP). As with bibliometrics, the collection and analysis of data related to Services to Canadians were brought back in-house, initially in fiscal year 2021–22 for the federal departments stream, and subsequently in fiscal year 2022–23 for the private-sector stream.

¹⁹ [Directive on Service and Digital](#)

SPACE DATA UTILIZATION EVALUATION

information currently omit several data elements required under the Directive. For example, data for NEOSSAT space surveillance imaging services and RADARSAT-2 EO data services were collected and reported but are not displayed correctly in InfoBase. In addition, service standards for infrastructure services (THEMIS and GO Canada sites) were developed and data were collected only for fiscal year 2024–25, explaining the absence of data for these services in Table 9.

Table 9. Program performance relative to the CSA Service Inventory.

Service and Associated Service Standard	2020-21*		2021-22		2022-23		2023-24	
	Target	Result	Target	Result	Target	Result	Target	Result
Historical Earth Observation Data (R-1): No service standard. ²⁰	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Earth Observation Data (RCM): The space and ground segment systems are available at all times to meet RCM requirements. The system is considered available when the three satellites and the earth system are operational and meet the required specifications.	N/A	N/A	90%	98%	90%	99%	90%	99%
Atmospheric Gas Surveillance Data (SCISAT): Data is released daily within 5 business days.	N/A	N/A	80%	100%	80%	86%	80%	97%
Space Imagery Data for Astronomy (NEOSSAT): Data delivered in less than an hour after downlink.	S/O	S/O	90%	100%	90%	100%	90%	100%
Earth Observation Data (R-2): All submitted billable acquisition requests are completed.	S/O	S/O	90%	93%	90%	96%	90%	97%
Space-based Automatic Identification System Data Services (SIA)²¹: Timely detection and dissemination of maritime traffic information delivered to client with an average daily latency of less than 3 minutes.	90%	100%	90%	57%	90%	89%	90%	100%
Availability of service- at least 99% during fiscal year 2022-23, which is 361.35 days out of 365 days.	S/O	S/O	S/O	S/O	99%	100%	99%	99%
Detection level, global maritime zone of interest (GMAOI)- at least 7,564 unique vessels detected daily on at least 99% of days in fiscal year 2022-23, being 361.35 out of 365 days.	S/O	S/O	S/O	S/O	99%	100%	99%	69%
Detection level, Canadian maritime zone of interest (CMAOI)- at least 73,314 unique vessels detected daily on at least 99% of days of fiscal year 2022-23, being 361.35 out of 365 days.	S/O	S/O	S/O	S/O	99%	46%	99%	100%
Detection level, global maritime zone of interest (GMAOI)- at least 223,253 unique vessels detected each day, on at least 50% of the days of the calendar year (182.5 days out of 365).	S/O	S/O	S/O	S/O	S/O	S/O	50%	71%
Detection level, Canadian maritime zone of interest (CMAOI)- at least 7,279 unique vessels detected each day, on at least 50% of the days of the calendar year (182.5 days out of 365).	S/O	S/O	S/O	S/O	S/O	S/O	50%	100%
Messages received within 8.91 minutes, on at least 50% of days of the calendar year (182.5 days out of 365).	S/O	S/O	S/O	S/O	S/O	S/O	50%	73%

²⁰ No service standard is required for this service, as it is defined as a “society-based” service. Once the data are made available online, no additional data are produced, and the service is freely accessible to users.

²¹ Four service standards are embedded in the contract and are monitored daily by the team. As such, this service is the one that most closely adheres to its service standards. In 2023–24, the Space Utilization Program (SUP) renewed the contract in January, and the service standards were adjusted to reflect client needs. As a result, the revised standards were implemented mid-year. Consequently, there were seven service standards in place for this service in 2023–24, three of which were modified during the fiscal year.

SPACE DATA UTILIZATION EVALUATION

Space Surveillance Analysis Reports (CRAMS): CRAMS reports are provided within one hour after a close-approach notification.	90%	100%	90%	98%	90%	99%	90%	100%
Atmospheric Data on Carbon Monoxide Concentration (MOPITT on Terra): The data are released daily within 3 business days.	S/O	S/O	80%	96%	80%	100%	80%	100%
Atmospheric Data on Ozone, Aerosols and Nitrogen Dioxide Concentrations (OSIRIS on Odin): The data is released daily within 3 business days.	S/O	S/O	80%	92%	80%	100%	80%	92%
International Charter on Space and Major Disasters: Activating countries receive the data that the CSA has committed to provide, in accordance with its operational capacities.	80%	96%	90%	100%	90%	100%	90%	98%
SAR Data User Support: A response is provided within 3 business days of the request.	S/O	S/O	90%	91% 100% ²²	90%	100%	90%	100%
Geospatial Observation Base Sites in Remote Regions of Canada: No service standards.	S/O	S/O	S/O	S/O	S/O	S/O	S/O	S/O
Ground Support for Space Sciences (THEMIS): No service standards.	S/O	S/O	S/O	S/O	S/O	S/O	S/O	S/O

Note: Data gathered from InfoBase platform.

*The Policy and Directive on Services and Digital came into force on April 1st, 2020. As a result, the majority of services do not have results for fiscal year 2020-2021.

**The information presented on InfoBase for these services is inaccurate, as the Space Utilization Program (SUP) has been tracking and reporting results for all of these services since the 2021–22 fiscal year.

For most available indicators, the program met its targets. The only service that did not meet all its targets relates to the space-based Automatic Identification System (AIS) data service. In 2021–22, performance reached 57% against a target of 90% for the timely detection and dissemination of maritime traffic information within an average of under three minutes per day. This result was due to a satellite configuration change, which led to an update of client needs and subsequent contract amendments to establish new service standards. The two additional gaps observed for this service (46% in 2022–23 and 69% in 2023–24) are attributable to seasonal effects on vessel presence during winter. The program indicated that these variations had no impact on client service delivery.

5. Efficiency

General Assessment. Overall, the program uses its human and financial resources appropriately to produce outputs and achieve expected results. However, it operates in a context in which satellite data needs and the user base are rapidly diversifying and growing, creating both opportunities and challenges. Program efficiency could be strengthened through clearer articulation of its strategic role in the downstream sector, improved definition of its target client groups, the development of a stakeholder engagement strategy, and clarification of the respective mandates of the SUP and the SCDP with respect to capacity development.

²² Two results are reported, as there were two ways to contact the team at the time: through online requests and through email requests.

5.1. Strategic Role and Vision

Over recent years, the program undertook several structuring initiatives to clarify its role within Canada's EO ecosystem and strengthen coordination with other federal departments. Notably, the creation of the Satellite Earth Observation Office in November 2022 represents a concrete effort to enhance interdepartmental coordination and foster more integrated governance. In response to recommendations from the 2023 OSPPA evaluation, the program also developed a management framework clarifying its strategic (mandate and role in Canada) and operational vision (structure, governance processes, roles and responsibilities within the program and across CSA sectors). In addition, it resumed work on developing a centralized tool to collect, organize, and prioritize long-term user needs.

Despite these advances, the evaluation finds that challenges remain related to the program's strategic vision, capacity development, partner engagement, ease of space data use, and internal accountability roles and responsibilities.

5.2. Role in Supporting Data Utilization

The program implemented several knowledge transfer initiatives intended to strengthen EO capacity. For example, as part of its commitment to the Departmental Sustainable Development Strategy, the CSA prioritized support for Indigenous communities. Since 2021, the CSA has collaborated with NASA to deliver EO application training as part of the Indigenous Mapping Workshop (IMW). Between 2021 and 2024, five workshops were held, including over 20 joint CSA–NASA sessions, reaching 360 participants, including 35 from two sessions in Nova Scotia. In addition, through the Committee on Earth Observation Satellites (CEOS), the SUP developed specialized training on SAR data use in a Canadian context. This training attracted 393 participants, including 145 international participants, indicating strong interest in this content.

These ad hoc activities demonstrate the program's commitment to supporting user capacity development and the expertise of SUP staff in delivering such initiatives. However, a leadership gap remains within Canada's EO ecosystem regarding user capacity development, as highlighted in the 2022 and 2024 National EO Forums and the 2023 OSPPA evaluation. It remains unclear to what extent these initiatives fall within, or should fall within, the CSA's and the SUP's mandate and strategic vision, resulting in recurring internal discussions whenever similar activities are proposed.

First, the Canadian Space Agency Act authorizes such activities. Section 5(2) assigns the CSA responsibility for designing, implementing, directing, and managing programs and activities related to scientific and industrial space R&D and the application of space technologies; promoting the dissemination and transfer of space technologies for the benefit of Canadian industry; and encouraging the commercial exploitation of the potential offered by space systems and infrastructure. The Act also grants the CSA residual authority over federal space-related matters not otherwise assigned to other departments or agencies.

Second, it is currently difficult to determine whether the SUP is the most appropriate CSA program to lead capacity-building initiatives, given the mandate of the Space Capacity Development Program (SCDP). According to key informants and the official description of the SUP, its role focuses primarily on making space data accessible and available. However, external use of space data is what enables the SUP to achieve

its objectives, and such use is facilitated through applications. The Application Development initiative²³ aims to support Canadian industry in developing innovative applications and services using space data and information. While this initiative is one of seven under the SCDP (led by the Space Science and Technology Branch), it is managed by the Space Utilization Branch. As such, SUP staff are responsible for delivering the initiative, but its results are attributed to the SCDP. The evaluation finds that clarifying the respective roles of the SUP and the SCDP would strengthen strategic coherence.

Between 2022 and 2024, the program also developed initiatives such as SmartHarbour to respond to emerging user needs. However, some new users, particularly provincial and municipal administrations, are not yet able to fully leverage satellite data. Nearly half of interviewed staff indicated that these administrations could benefit more from space data if access and usability were simplified. Several respondents emphasized limited resources and expertise at these levels, despite their responsibility for critical areas such as flood response.

These findings are reflected in the Digital Earth Canada (DEC) socioeconomic analysis commissioned by the CSA in 2024:

“Flood response is a provincial responsibility. The Government of Newfoundland notes that access to up-to-date Earth observation data would improve its capacity to respond following a flood. However, limited internal resources and capabilities restrict its ability to fully exploit these data, particularly for image processing, in order to understand the extent and impacts of flooding.”²⁴

Here again, it is not clearly established whether these entities are considered target clienteles of the SUP, nor what the program’s strategic vision is with respect to capacity development to enable or facilitate the use of satellite data by these actors. In theory, nothing prevents the Government of Canada from collaborating with provinces and municipalities, provided that certain legal considerations are taken into account.

Internal Roles and Responsibilities Related to Accountability

The evaluation identified a lack of clarity regarding the objectives and attribution of results for the smartEarth initiative between the SUP and the Space Capacity Development Program (SCDP). Over the evaluation period, this situation not only resulted in efficiency losses for both programs, due to the complexity of the accountability process, which often requires discussions and negotiations among stakeholders, but also created challenges in understanding and reporting on the actual and intended impacts of the programs in light of the funding allocated.

One illustration of this situation is the complex launch of the Research Opportunities in Satellite Earth Observation (ROSEO) Call for Proposals, published under smartEarth in October 2023. ROSEO was

²³ Contribution agreements entered under the CSA’s “Application Development” initiative provide financial support that helps Canada’s downstream industry access and fully leverage space data and information in order to develop new applications or enhance existing ones, thereby positioning themselves in the Canadian and global markets.

²⁴ NovaSpace. (2024). *Measuring the socioeconomic benefits of Digital Earth Canada (DEC)*. Draft final report. September 18, 2024. Montréal.

intended to provide financial support, through grants, to universities and postsecondary institutions conducting satellite EO application development projects. While ROSEO's objectives align with those of smartEarth and the SUP, they also align with the objectives of the SCDP, particularly the Flight and Field Investigations in Space Technologies and Sciences (FAST) initiative, which aims to encourage space-sector research in Canadian postsecondary institutions through grants.

Key informants from various sectors and levels within the CSA indicated that the SUP faces challenges in linking its investments and efforts (i.e., inputs and activities) to its results. The evaluation found that expenditures and budget forecasts coded under BLI 03-5-1 of the SCDP include grants and contributions awarded under the smartEarth application development initiative. According to key informants, this does not align with the strategic decision made between the two programs. Data indicate that smartEarth grants, linked to the SUP's expected academic outcomes, should be coded under the SUP, while only smartEarth contributions, linked to the SCDP's expected industrial outcomes, should be coded under the SCDP, in order to respect each program's mandate and scope.

"smartEarth helped fill a gap in application and capacity development. However, it is not at all clear which program the results should be attributed to."

- Key internal Informant

Here again, clarifying the roles and responsibilities between the SUP and the SCDP would help optimize human and financial resource use, strengthen departmental accountability, and better support strategic investment planning.

5.3. Role in Stakeholder Engagement

The program actively contributes to the development of Canada's satellite EO community through knowledge-sharing and engagement initiatives. Key activities include Geomatics Days (130 participants in 2024), the *"EO in Orbit"* webinar series (115 participants in the most recent edition), and the National EO Forums (2022 and 2024), which attracted between 200 and 300 participants per day. These events allow the program to engage with diverse users and gather perspectives on key issues related to satellite data use.

At the 2024 National EO Forum, organizations such as the Saskatchewan Association of Lands and Technology (SALT) and Ya' Thi Néné Lands and Resources highlighted specific needs to increase Indigenous community engagement, particularly the translation of technical concepts into Indigenous languages and the integration of traditional knowledge with EO data. These concerns suggest that a broader and more proactive engagement approach would be beneficial, extending beyond ad hoc project funding.

To date, the program does not have a stakeholder engagement strategy or a process to track results in this area. In addition, two separate teams within the program (the smartEarth team and the partner relations team) share engagement responsibilities, which has generated concern and confusion among some key informants. This issue is compounded by the previously noted lack of clarity regarding target clienteles.

Finally, most key informants believe that the Canadian public remains largely unaware of the role of satellite EO data in daily life and of the CSA's contribution in this area. This was also observed during site visits, such as at the Marine Mammal Interpretation Centre (CIMM) along the St. Lawrence River, where staff indicated familiarity with the SmartWhales initiative through other federal organizations, but limited awareness of

the CSA's central role. The program could therefore strengthen outreach and promotional efforts to improve public understanding and support for satellite EO services and applications.

5.4. Optimization of Data Access and Openness Processes

According to the CSA's Open Government team and its Centre of Expertise on Data and Emerging Technologies, "accessible" data are data that can be obtained and used by anyone, but which remain subject to restrictions such as usage limits, authentication requirements, copyright protections, or privacy considerations, factors that may limit usability and reuse. By contrast, "open" data refer to data and information available to the public without restrictions on use, reuse, redistribution, or modification. This definition aligns with that of the European Commission, which defines open data as non-discriminatory, complete, primary (not aggregated), timely, machine-readable, non-proprietary, license-free, permanent, and free of charge.²⁵

Presentations from the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs on the Copernicus program illustrate the economic and usage benefits of open EO data. The economic value of opening and reusing public-sector information is estimated at approximately €40 billion annually in the EU and £1.8 billion in the United Kingdom.²⁶ Similarly, a 2019 NEXTSPACE study on Copernicus open data highlights projected gains of €6–64 billion over 20 years, compared to restricted access.²⁷

Canada's 2022 EO Strategy identifies improved access to open data as a priority. Most employees interviewed support this direction, viewing open data as a lever to increase satellite data use and stimulate innovation and economic growth. International examples, such as Europe and Australia, are frequently cited as models for embedding open data within legislative and operational frameworks.

In 2019, the CSA announced that 36,500 RADARSAT-1 archive images (from 1995–2013) would be made available free of charge via the Government of Canada EO Data Management System. To date, 97% of RADARSAT-1 archive data have been recovered and made available over 676,900 images, representing an 18-fold increase. In 2024–25, 914 RADARSAT-1 archive images were downloaded by users.

Internal documentation related to user requirements for the successor mission to the RCM (currently in planning) aligns with this trend, emphasizing that application development requires collaboration among government users, academia, and industry, and that open data policies, where appropriate, facilitate collaboration while respecting security requirements.

²⁵ Breger, P. (n.d.). Copernicus full, free and open data policy. European Commission – DG GROW. <https://docslib.org/doc/6259994/copernicus-full-free-and-open-data-policy>

²⁶ Ibid.

²⁷ NEXTSPACE Consortium. (2019). Study on the Copernicus data policy post-2020. April 2, 2019. https://www.copernicus.eu/sites/default/files/2019-04/Study-on-the-Copernicus-data-policy-2019_0.pdf

A distinction persists between scientific data and operational data. Most CSA scientific data are open, whereas SAR data from operational missions (e.g., RCM) are subject to accreditation due to the sensitivity of some imagery. While 57% of external survey respondents believe there is a sufficient amount of open data, 43% feel that more data could be opened to maximize use of existing datasets. Internal interviews reflect similar differences of opinion.

5.4.1. Security of Sensitive Data: A Constraint on Optimal Use of Space Data

The security of EO data is both a technical and strategic priority for the federal government, and the evaluation finds that the program is vigilant in this regard. As EO is increasingly recognized globally as critical infrastructure, integrated into defence, climate policy, and emergency response, the security and sovereignty of space data remain key concerns, including privacy, national security, and data integrity.

While no major concerns were raised by external survey respondents, some expressed apprehension regarding the security implications of increasing EO data openness. Internal key informants also expressed reservations about opening EO data, particularly SAR data from operational missions such as the RCM, due to their dual-use (civil and military) nature, especially given their use by the Department of National Defence. As a result, no internal consensus exists regarding which EO datasets should or should not be made public.

“If we are talking about scientific data and space surveillance, that works fine. The issue is Earth imagery. I don’t believe that open data is the way forward for Earth observation data, as it could have implications for the security of Canadians. At the same time, Google Earth already exists, and there are satellites from other countries as well as private satellites. We don’t really have control over that.”

- Key internal informant

For many internal informants, the Remote Sensing Space Systems Act (RSSSA), which has been in effect since 2005, and its associated regulations represent a significant constraint on data accessibility and openness. An independent 2022 review of the Act²⁸ concluded that Canada’s regulatory framework is more restrictive than those of other countries, potentially limiting technological development, innovation, and investment. While the RSSSA has been effective in managing security and foreign policy risks, the review found that certain controls could be safely reduced to reflect the evolving risk environment.

Canada is not alone in restricting access to EO data for security reasons. For example, the European Commission’s Delegated Regulation No. 1159/2013 allows Copernicus data to be open, except for EO data used for security purposes, such as maritime surveillance, border monitoring, and EU external action and security support.^{29 30} Access to such data is restricted to EU member states.³¹

²⁸ Global Affairs Canada. (2022). 2022 independent review of the Remote Sensing Space Systems Act (RSSSA). Prepared by Space Strategies Consulting Ltd., March 21, 2022. <https://international.canada.ca/en/global-affairs/corporate/reports/rsssa-review-2022>

²⁹ Breger, P. (n.d.). Copernicus full, free and open data policy. European Commission – DG GROW. <https://docslib.org/doc/6259994/copernicus-full-free-and-open-data-policy>

³⁰ Copernicus Programme. (n.d.). Copernicus Security Service. <https://www.copernicus.eu/en/copernicus-services/security>

³¹ Breger, P. (n.d.). Copernicus full, free and open data policy. European Commission – DG GROW. <https://docslib.org/doc/6259994/copernicus-full-free-and-open-data-policy>

5.4.2. Optimization of RCM Data Acquisition and Accreditation Processes

Improvements have been made to the accreditation process for access to RCM data, notably through the introduction of prefilled interactive PDF forms with electronic signatures, which has helped facilitate applications. However, the accreditation process remains complex, with an average accreditation time of 100 days for Canadian organizations, although this varies significantly from one user to another. Since 2020, 154 of 176 cancellations were due to users abandoning the process (out of 427 accredited individuals, including 264 in Canada).

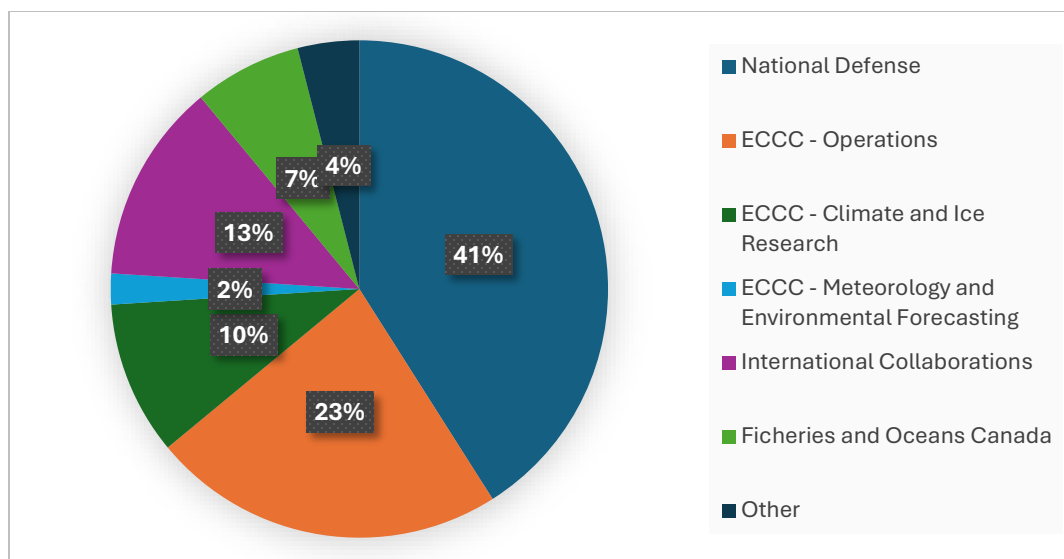
Since the RCM's launch in 2019, departmental data needs have increased steadily, and the mission reached full capacity in 2021. An interdepartmental working group was therefore established to prioritize standardized coverage. Priority is given to routine operational requests, and initiatives such as request pairing and automation increased completed acquisitions from 263,806 to 444,866 between 2020 and 2024. A 2024 system upgrade also improved efficiency by achieving equivalent coverage with less acquisition time.

Despite these efforts, not all ad hoc departmental requests can be met due to capacity constraints. Since mission start, RCM usage has been approximately 66% for routine operations, 15% for low-priority acquisitions³², 15% for standard R&D, and 4% for ad hoc requests. Authorized users may submit ad hoc requests without consulting the Standard Coverage Working Group, but success rates remain low if coverage already exists.

Currently, coverage adequacy is assessed through simulations only. No tool exists to measure satisfaction with actual delivered coverage, though development of such a tool is being considered. Figure 6 shows that the proportion of RCM usage time varies considerably across different departments, providing an indication on how priorities are set.

Figure 6. RCM usage time by departmental division 2020-24.

³² Acquisitions that do not conflict with other user requests are stored (without being processed) to create a global and thematic archive, while also optimizing satellite usage.



Currently, the RCM acquisition team assesses the level of alignment between the initial request and the final product in terms of requested coverage based solely on simulations. To do so, they take all standardized coverage orders from a given quarter and simulate them in order to identify those with lower performance, with the aim of optimizing them as much as possible. To date, they do not have an equivalent tool to measure satisfaction rates for actual coverage. The development of a tool to assess the percentage of satisfaction for real coverage is being considered, but no timeline has yet been established for its implementation. As such, with respect to trends between expectations and actual results, it is difficult to provide precise statistics.

Conclusion and Recommendations

The Space Utilization Program (SUP) plays a structuring role in the fields of Earth Observation (EO) and Space Situational Awareness (SSA). It makes a significant contribution to the delivery of government services, scientific research, national security, environmental protection, and innovation. The satellite data provided by the program is useful and widely used by federal departments, the academic sector, and industry.

Canada's space ecosystem is evolving rapidly, with growing demand for satellite data and an increasingly diverse user base. Beyond traditional clientele, provincial governments, municipalities, and Indigenous communities are demonstrating increased interest. En effet, ces groupes sont de plus en plus sensibilisés aux avantages que procurent les données spatiales pour leurs mandats, priorités et objectifs respectifs. In 2023, the evaluation of Observation Systems, Planning and Preparatory Activities (OSPA) highlighted the growing need for space data in Canada, as well as the essential role played by the CSA and the SUP in this area. External key stakeholders expressed the desire for the CSA to become more involved in the phases following satellite launch as emerging needs arise, given its recognized role as Canada's centre of expertise in the space domain and observation systems.

During the period covered by the evaluation, the program demonstrated responsiveness to this new reality. It showed an ability to adapt to emerging needs through innovative initiatives such as SmartHarbour, SmartWhales, and the funding provided for the Indigenous application SIKU. In addition, it established an

EO Coordination Office, undertook actions to enhance knowledge transfer and stakeholder engagement, developed a management framework to clarify its strategic and operational vision, and resumed the development of a centralized tool to collect, organize, and prioritize user needs over the longer term.

Nevertheless, challenges remain with respect to the program's strategic vision and implementation. In particular, the evaluation identified a lack of clarity regarding the objectives and attribution of results of the SmartEarth initiative between the SUP and the CSA's SCDP. During the evaluation period, this situation not only resulted in a loss of efficiency for both programs due to the complexity of the accountability process, which often requires discussions and negotiations among stakeholders, but also created difficulties in understanding and reporting on the actual and expected impacts of the programs in light of the funds allocated. Moreover, the SUP does not have a stakeholder engagement strategy, despite its fundamental role in the development of observation systems and the use of space data in Canada. Responsibilities related to engagement are also shared between two distinct teams within the program, further increasing confusion and concerns.

Additional efforts are required to optimize the human and financial resources allocated to the program and to ensure its continued relevance within Canada's evolving space ecosystem. More specifically, the program would benefit from clarifying its strategic role in the downstream sector with respect to the use of space data and application development, including its role in capacity development. Furthermore, a clearer and more detailed definition of target client groups, a stakeholder engagement strategy, and a clarification of internal roles and responsibilities between the SUP and the SCDP with respect to capacity development would enable the SUP to maximize its human and financial resources, better support strategic investment planning, and facilitate the departmental accountability process.

In light of the key findings outlined above, the evaluation recommends the following actions to enhance program efficiency and ensure its continued relevance:

1. Clarify the strategic role of the SUP within the Canadian space ecosystem with respect to data use and application development, and in doing so, explicitly define the program's target client groups.
2. Clarify internal roles and responsibilities related to capacity development and stakeholder engagement and develop a stakeholder engagement strategy.

Management Response and Action Plan

Recommendations	Management Response	Action Plan Details	Responsibility	Timeline
R1. Clarify the strategic role of the SUP within the Canadian space ecosystem with respect to data use and application development. In doing so, explicitly define the program's target clienteles.	Senior management of the program and of the CSA agrees with this recommendation.	1. Consult internal stakeholders to update the clienteles currently targeted by programs with a role in data use and application development. 2. Based on strategic directions and ecosystem needs, identify potential gaps in the program's target clienteles (i.e., define who the program intervenes with and why). 3. Review the Performance Information Profile(s) and revise, as required, based on Actions #1 and #2, to explicitly define the program's target clienteles.	Director General, Space Utilization Program In collaboration with the Director General, Space Capacity Development Program, and the Executive Director, Strategic Policy and Internal Affairs	March 2028
R2. Clarify internal roles and responsibilities related to capacity development and stakeholder engagement and develop a stakeholder engagement strategy.	Senior management of the program and of the CSA agrees with this recommendation.	1. Consult internal stakeholders to ensure alignment and efficient coordination of engagement activities with strategic directions. 2. Develop a stakeholder engagement strategy, including key engagement activities in support of strategic directions and internal roles and responsibilities for implementation. 3. Analyze options for tracking and monitoring engagement activities and interactions with stakeholders.	Director General, Space Utilization Program In collaboration with the Executive Director, Communications and Public Affairs; the Director General, Space Capacity Development Program; the Executive Director, Strategic Policy and Internal Affairs; and the Executive Director, Exploration and Space Industry Policies	September 2028

Frequently Asked Questions

1. What are space data and what are they used for?

Space data refer to data collected by space-based instruments about the Earth, its atmosphere, the Earth system, and the space environment. These data support informed decision-making in areas such as environmental monitoring, disaster management, national security, maritime safety, and scientific research, and contribute to services delivered to Canadians.

2. Why is the Canadian Space Agency evaluating the use of space data?

The evaluation assesses the relevance, effectiveness, and efficiency of activities related to the use of satellite data produced and delivered by the Space Utilization Program (SUP), as well as related activities such as application development and services to Canadians. Its purpose is to provide a neutral, evidence-based assessment to support decision-making and the continuous improvement of the program.

3. How do space data benefit Canadians?

Space data enable services delivered by federal departments, academia, and industry that improve the lives of Canadians. These include services related to emergency and disaster response (e.g., floods and wildfires), environmental monitoring (air and water quality), marine safety, wildlife protection (e.g., North Atlantic right whales), and the safety and resilience of northern and Indigenous communities.

4. Are Canadian satellite data accessible to the public?

Many datasets supported by the Canadian Space Agency are accessible, including a large proportion of scientific data and historical Earth observation data. However, some Earth observation data—particularly high-resolution data from operational missions—are subject to restrictions due to security, legislative, and regulatory requirements.

5. Why is access to some space data restricted or time-consuming?

Certain Earth observation data, such as RADARSAT Constellation Mission (RCM) data, are considered sensitive and require an accreditation process under the Remote Sensing Space Systems Act. This process helps ensure that data with potential dual-use implications are used appropriately and may take several weeks or longer to complete.

6. Who are the main users of space data in Canada?

The primary users are federal departments, academia, researchers, and industry. Demand for space data is also increasing among provinces, municipalities, territorial governments, and Indigenous communities, particularly for applications related to emergency management, environmental monitoring, and land-use planning.

7. Is Canada a leader in Earth observation?

Yes. Canada is internationally recognized for its expertise in satellite radar, notably through the RADARSAT Constellation Mission. Canada also contributes to international satellite missions and partnerships and plays an active role in initiatives such as the International Charter “Space and Major Disasters.”

8. What challenges have been identified in the use of space data?

Key challenges relate to access to satellite data, ease of use, coordination within the space data ecosystem, clarity of federal roles and responsibilities, and balancing data openness with security requirements.

9. What innovative initiatives related to space data utilization have been supported?

The Canadian Space Agency has supported innovative initiatives, including:

- **SIKU**, an Indigenous-led platform that integrates satellite data with traditional knowledge to support safety on land and ice;
- **SmartWhales**, which uses Earth observation data to help protect North Atlantic right whales;
- **SmartHarbour**, which supports environmental monitoring and decision-making for Canadian ports using satellite data.

10. What improvements are recommended following the evaluation?

The evaluation recommends clarifying the strategic role of the Space Utilization Program with respect to data utilization and application development, explicitly defining target clienteles, clarifying internal roles and responsibilities related to capacity development and stakeholder engagement, and developing a stakeholder engagement strategy.

Annexes

Annex 1: Glossary

Upstream Activities (Upstream Segment)

Activities related to consultation, design, testing, manufacturing of space components (e.g., satellites, spacecraft, payloads) or ground components (e.g., ground facilities and equipment for satellite operations), integration, and launch of assets or systems into space.

Downstream Activities (Downstream Segment)

Activities related to daily operation of space systems, production of products and software applications that transform space data and signals into useful end products, as well as services delivered to end users. This sector includes private, public, and academic organizations and notably includes satellite operations and services.

Applications

A subset of software that uses the full capabilities of an electronic device directly to perform a desired user task.

Departmental Results Framework (DRF)

Includes a department's core responsibilities, departmental results, and related performance indicators.

Target

A measurable level of performance or success that an organization, program, or initiative aims to achieve over a given period; targets may be quantitative or qualitative.

Contribution

A transfer payment with specified performance conditions set out in a funding agreement; contributions are subject to accountability and audit.

Accessible Data

Data that can be obtained and used by anyone but may still be subject to restrictions (e.g., usage limits, authentication, copyright, privacy).

Application Development

CSA initiative to help Canadian industry develop new applications (products and services) using space data and information. Contribution agreements support downstream industry access to space-derived data to develop or enhance applications.

Open Data

Data and information available to the public without restrictions on use, reuse, redistribution, or modification.

Space Data

Includes: (1) data collected by space-based instruments about what they measured (e.g., Earth surface);

(2) data collected by space-based instruments about space; (3) data collected from the ground about space. Excludes satellite housekeeping data.

Effectiveness

The extent to which a program or policy achieves expected results.

Efficiency

The extent to which resources are used to maximize outputs for given inputs or achieve the same outputs with fewer inputs.

Full-Time Equivalent (FTE)

Measure representing one person-year of work, calculated in accordance with collective agreements.

Satellite Operations

Day-to-day satellite management after launch (e.g., telemetry and command, monitoring, collision avoidance, mission planning, uplinks/downlinks).

Evaluation

Systematic, neutral collection and analysis of evidence to assess relevance, effectiveness, and efficiency to support decision-making and accountability.

Output

Direct products or services resulting from activities, generally under organizational control.

Indicator

Qualitative or quantitative measure used to assess performance relative to expected results.

Expected Result Indicator

Indicator used for program accountability with respect to expected results under the Policy on Results.

Departmental Result Indicator

Indicator used for departmental accountability under the DRF.

Space-Enabled Information

Information that exists because space solutions were used (e.g., EO data, derived products, or satellite communications-enabled information).

Input

Financial and non-financial resources used to implement programs and produce outputs.

Space Missions

Space voyages by crewed or uncrewed vehicles for a specific purpose (e.g., data collection); may include multiple satellites.

CSA-Supported Missions

All missions supported or invested in by the CSA (domestic, international, commercial, or ESA-related).

Service Standard

Public commitment to a measurable level of service performance.

Earth Observation (EO)

Field involving development and use of satellites to measure and monitor Earth for purposes including resource management, disaster assessment, security, and defence.

Highly Qualified Personnel (HQP)

Employees in the Canadian space sector with at least a bachelor's degree.

Relevance

The extent to which a program, policy, or other entity responds to or is aligned with a demonstrable need. Relevance may also be used to determine whether a program, policy, or other entity is a government priority or falls under a federal responsibility.

Policy on Service and Digital

This policy, together with its supporting instruments, constitutes an integrated set of rules describing how Government of Canada organizations manage service delivery, information and data, information technology, and cyber security in the digital age.

Performance Information Profile

A document that presents performance-related information for each program included in a federal organization's Program Inventory.

Program

A group of inputs composed of resources and related activities that is managed to respond to specific needs and achieve intended results, and that is often treated as a budgetary unit.

Program of Grants and Contributions

As defined in subsection 42.1(2) of the Financial Administration Act, a program of grants or contributions refers to any program involving the payment of grants or contributions to one or more recipients from funds appropriated by an appropriation act and managed to achieve a common objective.

Research and Development (R&D)

Systematic work undertaken to create new products, processes, or techniques, or to improve those already in existence. Program activities aimed at preparing Canada to address future challenges by investing in cutting-edge research and development, as well as specialized training and education.

Performance

The use of resources by an organization or program to achieve results; the extent to which actual results compare against what the organization or program intended to achieve (expected results); and the extent to which lessons learned have been identified.

Core Responsibility

An ongoing function or role performed by a department. A department's intentions regarding a core responsibility are expressed through one or more departmental results that the department seeks to achieve or influence.

Service Inventory

A catalogue of integrated external and internal services that provides detailed information based on a defined set of elements (e.g., delivery channel, client, volume).

Program Inventory

A compilation of all departmental programs and a description of how resources are organized to enable the department to carry out its core responsibilities and achieve results.

Result

An external consequence that is partly attributable to the activities of an organization, program, initiative, or policy. Results are established at various levels of an organization's performance framework, including program outputs and departmental results.

Program Outcome

A change or consequence attributable to outputs, or to which program outputs or outcomes contribute. Program outcomes may be short, medium, or long-term; they are generally more directly influenced by departmental activities and are within greater departmental control than departmental results. Program outcomes exist at the program level, whereas departmental results are located at the core responsibility level.

Departmental Result

A change that departments seek to influence. Departmental results generally fall outside the direct control of departments but are expected to be influenced by program outcomes.

Canadian Space Sector

The community of public, private, and academic organizations whose activities involve the development and operation of space systems, or the collection and use of satellite data.

Service

A final, specific output that meets one or more needs of an intended beneficiary and contributes to the achievement of a result.

Services to Canadians

Services include all information products or services delivered to Canadians by other departments that incorporate satellite-based data or services supported by the CSA, as well as all services delivered by companies that were developed with CSA support. Services offered also include datasets provided to

researchers through the funding of Canadian missions or through the CSA's participation in international missions. The number of services delivered to Canadians is a robust indicator for measuring the impacts of activities in the space sector.

Space Solutions

Solutions that address specific needs, including the use of equipment located beyond Earth's atmosphere.

Grant

A grant is a transfer payment made based on predefined eligibility criteria and other conditions. A grant is not subject to recipient reporting or, generally, to departmental audit requirements. However, recipients may be required to report on achieved results.

Space Situational Awareness (SSA)

A domain of activity aimed at protecting operational assets in space and on Earth. Space situational awareness includes three sub-domains: space debris, space weather, and near-Earth objects.

SPACE DATA UTILIZATION EVALUATION

Activity Groups	Activity Elements	Type of Expenditure	2020-21		2021-22		2022-23		2023-24		TOTAL		
			Forecast (\$)	Actual (\$)	Forecast (\$)	Actual (\$)	Forecast (\$)	Actual (\$)	Forecast (\$)	Actual (\$)	Forecast (\$)	Actual (\$)	
BLM 02-4 (SUP) Data Utilization and Application Development	BLM 02-4-1 – Data Utilization and Application Development in EO 33	Salaries	589,000	1,160,195	1,257,000	1,100,313	453,000 \$	1,137,041	1,653,000	1,349,808	27,105,000	24,506,009	
		O&M	522,700 \$	2,220,489	4,457,000	3,443,817	3,996,000	2,282,893	2,998,000	2,886,195			
		Capital	0	0	0	0	0	0	0	0			
		Grants	1,450,000	1,743,581	1,725,000	1,922,043	1,725,000	1,922,165	1,575,000	1,337,469			
		Contributions	0	0	0	0	0	0	0	0			
		FTEs	8.45		10.02		10.4		12.6				
	BLM 02-4-2 – Data Utilization and Application Development*	Salaries	74,000	0	0	0	30,000	0	0	8,445	104,000	8,445	
		O&M	0	0	0	0	0	0	0	0			
		Capital	0	0	0	0	0	0	0	0			
		Grants	0	0	0	0	0	0	0	0			
		Contributions	0	0	0	0	0	0	0	0			
		FTEs	0	0	0	0	0	0	0				
	BLM 02-4-3 – Data Utilization and Application Development in SSA34	Salaries	79,000	45,667 \$	60,000 \$	40,477	69,000	47,928	69,000	11,946	6,652,000	5,254,723	
		O&M	100,000	0	0	0	0	0	0	0			
		Capital	–	0	0	0	0	0	0	0			
		Grants	1,550,000	1,356,418	1,625,000	1,377,956	1,625,000	1,377,834	1,475,000	996,497			
		Contributions	0	0	0	0	0	0	0	0			
		FTEs	0.41		0.38		0.46		0.1				
BLM 03-5 (SCDP)	BLM 03-5-1 – Application Development (smartEarth G&C)	Salaries	364,000	0	0	0 \$	442,000 \$	0	0	0	15,139,219	11,743,999	
		O&M	0	0	0	0	0	0	0	0			
		Capital	0	0	0	0	0	0	0	0			
		Grants	0	0	0	0	0	0	2,000,000 \$	2,000,000			
		Contributions	1,520,000	1,389,798	5,114,000	4,181,884	4,000,000	4,473,098	1,699,219	1,699,219			
		FTEs	0		0		0						
Total – Data Utilization and Application Development		10,953,000 \$	7,916,148 \$	14,238,000 \$	12,066,490 \$	12,310,000 \$	11,240,960 \$	11,469,219 \$	10,289,579 \$	48,970,219 \$	41,513,176 \$		
Total				65,362,290	53,942,610	74,983,000	57,613,445	71,788,000	54,863,371	91,167,219	64,932,452	303,300,509	231,351,879
Share of total SUP expenditures related to data utilization and application development				17%	15%	19%	21%	17%	20%	13%	16%	16%	18%

Annex 2: Financial forecasts and actual expenditures by activity element (2020–2024)

Note: Data provided by CSA Finance Team

³³ smartEarth, IGOT, SCISAT, Earth system science, ROSS, RCM

³⁴ SSA, SWARM, ROSS, CRAMS.

SPACE DATA UTILIZATION EVALUATION

* Financial resources coded under SCDP BLM 03-5-1 include grants and contributions awarded for application development under the smartEarth initiative; according to key informants interviewed, this does not align with the strategic decision made between the SUP and the SCDP.

Annex 3: Open Data (2024)

Missions / Initiatives	Number of datasets with an open license	% of data that are open	Additional explanations
smartEarth	0%	0%	
RADARSAT-1	674,424	100%	All data is open and accessible through the Earth Observation Data Management System (EODMS).
RADARSAT-2	0	0%	No data is open. MDA is the owner of the satellite and the data. The Government can purchase imagery for government use through usage credits. However, the license does not allow data sharing or open release.
RADARSAT Constellation Mission (RCM)	625,322*	36.09%	Some data are open. Acquisitions carried out by DND are not part of the authorized data. The SDAC web services, developed by MDA, are responsible for filtering acquisitions that may or may not be shared. Authorized Type-A users (vetted users) have access to a greater number of products. However, this audit considers only data that is open to the public.
SCISAT	77 molecules with an average of 120,000 datasets each	100%	All data from the Canadian SCISAT satellite are open. They are accessible via the CSA Open Data Portal. The data covers the period from February 2004 to February 2024.
NEOSSAT	807,896 images	50%	Data are divided into two categories: astronomical data and data for asteroid and space-debris tracking- Space Surveillance (SSA). Astronomical data represent half of the data collected by the satellite. Only astronomical data are open and accessible through the CSA Data Portal and the Canadian Astronomy Data Centre.
MOPITT on Terra	6,992 CSV data files	89%	The satellite has not been operational since May 11, 2024. Data from 2000 to 2020 are open and accessible via the CSA Open Data Portal. However, data from 2020 to May 2024 are not yet open.
OSIRIS on ODIN	40,552 NetCDF files and 1,006,453 CSV data files	71%	The Swedish satellite has been active in orbit since February 2001. Data from October 2001 to December 2017 are open and accessible via the CSA Open Data Portal. However, data from January 2018 to the present are not yet open.
THEMIS	ASI: 141 TAR data files CMAG: 20 TAR data files	ASI: 65% CMAG: 75%	This dataset includes data from the All-Sky Imagers (ASI) and ground-based magnetometer (CMAG) instruments. These instruments collect night-sky data to improve forecasting and understanding of auroral behaviour. For ASI, each file covers one month of observation. For CMAG, each file covers one year of observation.
SWOT	48 NetCDF data files 8 Shapefile data files	100%	No data is currently open on the CSA Open Data Portal. However, the data is 100% open. They are hosted on the NASA website.
CASSIOPE	N/A**	100%	
Alouette-1	699,369 ionograms	100%	
CRAMS	0	0%	No data resulting from CRAMS software calculations are open. In addition, the input data originate from Space-Track (U.S. 18th Space Squadron) and are not open.
Go Canada	SEC: 580 products SuperDARN: under development	100%	SEC = Space Environment Canada

* Only public EULA data are considered. It should be noted that the public EULA includes certain restrictions and is therefore not fully aligned with the definition of an open license. Authorized Type-A users (vetted users) are not included.

** Difficulty in quantifying.

Annex 4: Innovative Initiatives

SIKU:

The Arctic is warming nearly four times faster than the rest of the world, and sea ice is changing at an unprecedented rate, making travel more dangerous and negatively affecting wildlife and flora as well as the traditional ways of life of Indigenous communities. To adapt to these new realities, the Arctic Eider Society and the communities of Sanikiluaq, Inukjuak, Umiujaq, Kuujjuaraapik, and Chisasibi, in consultation with regional Indigenous organizations across the North, created SIKU, a website and mobile application designed by and for Indigenous communities and harvesters.³⁵ SIKU allows users to communicate near real-time observations of ice conditions, wildlife, and weather, while also having access to satellite imagery and other data. This combination enables people to remain safe on the land and ice, maintain connections between regions, and transmit the most up-to-date knowledge possible. SIKU is used by more than 32,000 people in over 130 communities across Canada, Greenland, and Alaska.

The project *Advancing Canada's role in Earth observation with SIKU* was funded by the Canadian Space Agency to the amount of \$500,000 under the smartEarth initiative. With CSA funding, the project made it possible to:

- Integrate RCM data into the SIKU platform to improve existing ice maps;
- Strengthen Earth Observation product dissemination systems tailored to the needs of Indigenous users, including documenting ice classifications in Inuktitut;
- Develop machine-learning-based methodologies to detect hazards, such as those associated with polynyas;
- Establish strong partnerships and increase collaboration among sea ice innovation experts, including governments, academia, and Inuit communities.

SmartWhales:

The SmartWhales initiative, launched in 2021 in collaboration with Fisheries and Oceans Canada and Transport Canada, aims to use satellite Earth observation data to protect North Atlantic right whales in Canadian waters. This species is endangered and is exposed in particular to risks such as vessel strikes and entanglement in fishing gear. Through financial support of \$5.4 million provided by the Canadian Space Agency under smartEarth and by Fisheries and Oceans Canada, five Canadian companies³⁶ proposed innovative solutions to support the detection and monitoring of North Atlantic right whales and to better predict and model their behaviour and movements. SmartWhales illustrates the Canadian Space Agency's significant contribution to environmental protection, biodiversity, and the conservation of marine

³⁵ Canadian Space Agency (CSA). (2025). SIKU: Where traditional knowledge and satellite data come together. September 29, 2025. <https://www.asc-csa.gc.ca/eng/blog/2025/09/29/siku-traditional-knowledge-and-satellite-data.asp>

³⁶ These companies are Arctus, Hatfield, Global Spatial Technology Solutions (GSTS), Fluvial Systems Research (FSR), as well as WSP Canada and DHI Water & Environment Inc.

mammals. Several key informants identified it as one of the program's greatest successes and as a model to follow for interdisciplinary projects within the federal government.

SmartHarbour:

The SmartHarbour initiative was developed in collaboration with the Montreal Port Authority and Public Services and Procurement Canada to develop innovative applications using satellite data in the context of the expansion of the Port of Montreal at Contrecoeur in Quebec.³⁷ Funded to the amount of \$4 million under the smartEarth initiative, SmartHarbour enabled the development of environmental monitoring solutions adapted to the port context, drawing on the expertise of academic, industrial, governmental, and community partners. It is the only Impact Assessment Agency of Canada project to explicitly include the use of space data in its conditions. It is also worth noting that, internationally, several countries have already implemented initiatives aimed at encouraging the use of Earth observation to assess the environmental impacts of projects. For example, the European Union has integrated Earth observation into the implementation of its deforestation regulation, which requires importers to demonstrate compliance of their products, under threat of sanctions, notably through satellite imagery used to support this demonstration. These practices offer interesting avenues for reflection for Canada regarding the potential scope of Earth observation uses.

³⁷ Canadian Space Agency (CSA). (2023). Smartharbour initiative: Satellite data to help monitor and protect our ecosystems. June 2023. <https://www.canada.ca/en/space-agency/news/2023/06/smartharbour-initiative-satellite-data-to-help-monitor-and-protect-our-ecosystems.html>

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Annex 6: Abbreviations and Acronyms

GAC	Global Affairs Canada
API	Application Programming Interfaces
NOO	Notice of Opportunity
CSA	Canadian Space Agency
SUSC	Space Utilization Steering Committee
CEOS	Committee on Earth Observation Satellites
MCUE	Space Utilization Management Committee
CIMM	Marine Mammal Interpretation Centre
DMF	Departmental Results Framework
CRAMS	Collision Risk Assessment and Mitigation System
DEC	Digital Earth Canada
ECCC	Environment and Climate Change Canada
ESA	European Space Agency
FTEs	Full Time Equivalents
O&M	Operations and Maintenance
EOGIP	Earth Observation Government Initiatives Program
IMW	Indigenous Mapping Workshop
JAXA	Japan Aerospace Exploration Agency
RSSSA	Remote Sensing Space Systems Act
RCM	RADARSAT Constellation Mission
NASA	National Aeronautics and Space Administration
AML	Application Maturity Level
TRL	Technology Readiness Level

SPACE DATA UTILIZATION EVALUATION

NPOs	Not for Profit Organizations
OSIRIS	Optical Spectrograph and InfraRed Imaging System
EO	Earth Observation
EODAP	Earth Observation Application Development Program
SCDP	Space Capacity Development Program
SEP	Space Exploration Program
HQP	Highly Qualified Personnel
PIP	Performance Information Profile
SUP	Space Utilization Program
R&D	Research and Development
NRCan	Natural Resources Canada
ROSEO	Satellite Based Earth Observation Research
ROSS	Research and Opportunities in Space Sciences
SAR	Synthetic Aperture Radar
SALT	Saskatchewan Association of Lands and Technology
SatCom	Satellite Communications
G&C	Grants and Contributions
AIS	Automatic Identification System
SOAR	Scientific and Operational Applications of RADARSAT
SOPAP	Observations, Planning, and Preparatory Activities Systems
SSA	Space Situational Awareness
SWARM	Seismic While Drilling and Advanced Rover Mobility
SWOT	Surface Water and Ocean Topography Mission
SU	Space Utilization
FAST	Flights and Field Investigations in Space Science and Technology

