Canada’s Roadmap for Open Science, Six Years On

by **Alan Colin Arce** | 13 February 2026 | **English**, **Observations**, **Observations and Responses**

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At a Glance

Topic / Titre	Canada's Roadmap for Open Science, Six Years On
Key Participants / Participants clés	DORA, Canadian Institutes of Health Research, Environment and Climate Change Canada, Innovation, Science and Economic Development Canada, Natural Resources Canada, Open Government Team, Office of the Chief Science Advisor, Royal Society Open Science, Statistics Canada, Treasury Board of Canada Secretariat, UNESCO, Canadian Commission for UNESCO
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Summary

This piece revisits Canada's *Roadmap for Open Science* (2020), which was released by the Office of the Chief Science Advisor and initially addressed within the Open Scholarship Policy Observatory by Caroline Winter (2020). Her work is built upon here by summarizing the *Roadmap* and considering it in today's context, five years since publication. Some previously identified limitations are discussed, as well as some future directions.

Introduction to Canada's *Roadmap for Open Science*

Canada's 2018–2020 National Action Plan on Open Government (2018)

contextualizes Canada's *Roadmap for Open Science* (2020) by arguing open federal science represents an integral aspect of 'open government', defined as "an approach to governance that focuses on transparency, accountability, and citizen participation" (Treasury Board of Canada Secretariat and Open Government Team 2018, Introduction).

Development of the *Roadmap* took two years. This process involved consultations with the scientific community in Canada. The *Roadmap* intersected with previous policies, such as the *Directive on Open Government* (2014), the *Tri-Agency Open Access Policy on Publications* (2015), and the *Tri-Agency Statement of Principles on Digital Data Management* (2015).

The *Roadmap* defines Open Science as:

> The practice of making scientific inputs, outputs and processes freely available to all with minimal restrictions. Scientific research outputs include (i) peer-reviewed science articles and publications, (ii) scientific and research data and (iii) public contribution to and dialogue about science. Open Science is enabled by people, technology and infrastructure. It is practiced in full respect of privacy, security, ethical considerations and appropriate intellectual property protection. (Office of the Chief Science Advisor 2020, Appendix, Definitions – 'Open Science')

This practical definition is tailored to the *Roadmap*'s purpose, as it focuses on "science and research funded by federal government departments and agencies" (Office of the Chief Science Advisor 2020, 'Objective').

Recommendations

The *Roadmap for Open Science* (2020) presents 10 recommendations. Based on Winter's summary (2020), these are:

1. Federally funded scientific research in Canada should be guided by an Open Science approach (Office of the Chief Science Advisor of Canada 2020, 7).
2. Policies and action plans should be developed in consultation with the scientific

community (7).

3. Federal departments and agencies should have Open Science action plans in place by October 2020. All research outputs should be "Open by Design and by Default," and the plans should address the sharing of legacy data (7).
4. All articles published in scholarly journals should be made open access upon publication as of January 2022, and all federal publications as of January 2023, possibly through tools and infrastructure shared across the federal science community (8).
5. Strategies for implementing *FAIR* (Findable, Accessible, Interoperable, Reusable) principles for research data and metadata should be in place by January 2023 and fully implemented by January 2025 (8).
6. The Chief Science Advisor should work with the federal science community to develop a framework for identifying research that should not be made openly available due to ethical, privacy, or security concerns (9).
7. Strategies developed in response to the *Data Strategy Roadmap for the Federal Public Service* (2018), *Canada's 2018–2020 National Action Plan on Open Government* (2018), and open government directives should be well aligned, under the guidance of a Chief Scientific Data Officer (9).
8. In order to achieve a national Open Science strategy that includes federally funded research conducted outside of federal departments and agencies, an Open Science Steering Committee should be established to consult with federal, provincial, and territorial funding agencies and learned societies to guide this strategy (9).
9. By December 2021, the Chief Science Advisor should conduct consultations to develop an Open Science strategy for research funded through federal funding agencies, provincial and territorial funders, and learned societies (9).
10. The *Roadmap* and related Open Science strategies and plans must remain responsive to the evolving international context of Open Science, which should be monitored by the Chief Science Advisor (10).

When published in 2020, the Roadmap was met with approval by members of the *INKE* partnership and community. Notably, both CARL and the President of the Federation for Humanities and Social Sciences supported its recommendation to develop Open Science strategies for federally funded research conducted outside of federal government agencies.

Where are we now?

Since the *Roadmap for Open Science* (2020) was published, much has changed within the Canadian context. *Canada's National Action Plan on Open Government 2022-2024* (2022) has been issued, both replacing and progressing *Canada's 2018-2020 National Action Plan on Open Government* (2018).

This *Action Plan* appears to consider Open Science a peripheral issue, largely solved by promoting the digital *Open Science and Data Platform* (*OSDP*), which "provides access to science, data, publications and information about development activities across the country that can be used to understand the cumulative effects of human activities" (Treasury Board of Canada Secretariat 2022; Natural Resources Canada and Environment and Climate Change Canada 2025).

Like the *Roadmap*, the *OSDP* foregrounds open access in its application of Open Science. However, unlike the *Roadmap,* the *OSDP* minimized its focus on Open Science, as indicated on the platform's 'About' page, the Open Science and Data Platform is highlighted in the 2022-2024 National Action Plan in terms of **making information related to cumulative effects easier for Canadians to find and understand**.

It appears the emphasis is placed on the findability and readability of research related to "cumulative effects," which the *OSDP* defines as changes in environmental, social, economic, and health conditions (Natural Resources Canada and Environment and Climate Change Canada 2024).

In addition to the establishment of the OSDP, in 2024, the Federal Open Science Repository was launched in response to the Roadmap. It provides public, web-based access to federally authored scientific articles and publications. However, Chantal Ripp (Research Librarian, U Ottawa) and Maddie Hare (Dalhousie University) warn that it is lagging in implementation:

> The curating of the repository content relies on researchers working with departmental staff, which has lagged in several departments (Environment and Climate Change Canada 2023; Bamford 2024). Transforming and enabling practices is not merely about investing in tools or infrastructure, it requires a multidimensional paradigm shift and successfully investing in people and

> processes, in addition to technology. It remains to be seen what the ultimate impact of recent federal budgetary cuts will have on these initiatives.

Changes in the Roadmap Focus Areas

The focus areas of the *Roadmap* have evolved since its publication. For example, the *Roadmap*'s Indigenous data strategy has been updated, as '*Recommendation 8*' of the *Data Strategy Roadmap for the Federal Public Service* (2018) evolved into sections '*Support for Indigenous Data Sovereignty*' and '*Recommendation 3.4*' of the *2023–2026 Data Strategy for the Federal Public Service* (2023), which promote the *Disaggregated Data Action Plan* (2023) and the *Transformational Approach to Indigenous Data* (Treasury Board of Canada Secretariat 2025).

Even the *Roadmap* itself has largely been 'fulfilled' by the 12 *Departmental Open Science Action Plans* developed in direct response to the recommendation that federal departments and agencies develop Open Science action plans (Innovation, Science, and Economic Development Canada 2024; Office of the Chief Science Advisor of Canada 2020, 7). Many of these Action Plans go beyond the original Roadmap in terms of their interpretation of Open Science. For example, the Environment and Climate Change Canada Open Science Action Plan not only considers open access to publications, but also developing data infrastructure and promoting knowledge mobilization initiatives. Similarly, Statistics Canada Open Science Action Plan has sections on FAIR and open data, open publications, open communications, and open code.

An analysis of the Federal Departmental Open Science Action Plans by Ripp et al. (2025) also found that there was a diversity of approaches to implementing open science practices. Departments more focused on Research and Development (R&D), such as the Canadian Space Agency or the National Research Council were more likely to support the publisher route (gold open access) to make federal science articles openly accessible. In contrast, departments more focused on related research activities, such as monitoring and regulatory research, tended to support the self-archive route (green OA) due to its lower costs.

However, Ripp et al. (2025) also warn that the Departmental Action Plans have limited mandates for oversight, with the most common ways for monitoring uptake of

open science practices being through bibliometric data and/or internal reporting mechanisms. In addition, only half of the action plans referred to incentives or recognition to support the adoption of open science practices. Therefore, there are still opportunities to better align research evaluation criteria with the principles and objectives of the Action Plans and the Roadmap.

Comparing Canada's Roadmap for Open Science to the UNESCO Recommendation on Open Science

A major change since the publication of the *Roadmap* was the publication of the *UNESCO Recommendation on Open Science* (2021) just one year after the Roadmap. The UNESCO Recommendation represented a significant development for Open Science on a global level with repercussions for open science policies in Canada. *UNESCO* defines Open Science as "a set of principles and practices that aim to make scientific research from all fields accessible to everyone for the benefits of scientists and society as a whole," while ensuring the production of knowledge "is inclusive, equitable and sustainable" (UNESCO 2023, Paragraph 1). This definition of Open Science emphasizes a breadth of disciplines beyond those addressed by Canada's *Roadmap, which only included* "fundamental and applied natural, physical, biomedical and social science, [...] engineering and mathematics" (Office of the Chief Science Advisor 2020, Appendix, Definitions – 'Science').

In Canada, the most recent definition of *Open Science* on the Office of the Chief Science Advisor's government webpage is closer to the definition in the Roadmap than in the UNESCO Recommendation. While Canada had an active participation in the drafting of the UNESCO Recommendation, the Canadian Government has maintained a narrow definition of open science aligned to the *Roadmap,* even though more inclusive definitions are being adopted internationally.

Indeed, Chtena et al. (2025) argue that the *Roadmap* focuses "almost exclusively on OA [open access], OD [open data] and scientist-to-scientist communication, reflecting a top-down approach that prioritizes institutional reforms over grassroots engagement" (p. 14), further criticizing its failure to consider Indigenous concerns and multilingualism. This stance also posits that the *Roadmap* limits public engagement to an ideal aspiration, not a practical goal with practical

recommendations.

Because the Roadmap is foundational to Canada's open science strategy, its narrow definition of open science has implications for related policy as well. For instance, the draft revised Tri-Agency OA Policy on Publications (2025) aligns with the Roadmap, the G7 Science and Technology Ministers' Communiqué, and the UNESCO Recommendation on Open Science. It uses the term "Open Science" without defining it, leading to some ambiguity in the policy's scope.

In light of the perceived differences between narrower definitions of open science, such as the 2020 *Roadmap for Open Science*, which prioritizes open access and open data, and broader definitions, such as the 2021 *UNESCO Recommendation on Open Science*, which emphasizes participatory and open aspects like citizen science, it will be interesting to compare Canada's implementation with that of other countries.

In 2025, the Member States of UNESCO submitted their first quadrennial reports on the measures and steps they have taken to implement the UNESCO Recommendation on Open Science (UNESCO 2025). UNESCO will provide a comprehensive analysis of the findings and trends of this reporting process in early 2026, which will allow to fully assess Canada's implementation of open science policies, including the priority areas for the country during these past five years.

Responses from the Open Scholarship Community

Chantal Ripp (Research Librarian, U Ottawa) and Maddie Hare (Dalhousie University):

This post compares the *Roadmap* to UNESCOs Recommendations on Open Science and explores the distinction in their scope and definition. I would argue the scope of the Canadian Roadmap is largely dictated by the science conducted in the federal landscape, as the recommendations were developed for intramural science and not extramural. For example, Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, Environment and Climate Change Canada, and Natural Resources Canada perform largely R&D or related scientific activities in the natural sciences.

In addition, the prioritization of open access to publications and open data is likely a

legacy of former National Action plans, which stated that “the Government of Canada will establish a government-wide approach to open science to increase access to federally funded scientific publications and data” (Treasury Board of Canada Secretariat, 2014). This output-centric approach has been perpetuated through the subsequent action plans and Roadmap. However, there could be further emphasis on the transformation of processes and practices, such as citizen science. Some departments did take a step further in their departmental action plans. For example, the Canadian Space Agency committed in Action 8 of its 2021-2024 Open Science Plan to develop tools for access and use of data by non-experts (i.e. citizen scientists). This was a strength in setting broad horizontal objectives but largely leaving implementation at individual departments.

The Roadmap and subsequent Action Plans, among other initiatives, arguably have also contributed to the institutionalization and normalization of Open Science practices in Canada, as opposed to previous largely voluntary uptake. Although it is hard to track, the influence of the national research policy extends to institutional strategies and practices, scholarly norms, and the development of further policy and infrastructure.

One important change in the Canadian open scholarship landscape since the Roadmap’s publication is the expansion and support for open access, for example, through the CRKN-Érudit partnership that supports hundreds of national journals. Furthermore, a study by van Bellen & Céspedes (2025) found that almost 60% of Canadian journals are diamond OA, which indicates a vibrant domestic OA landscape and infrastructure.

Another change is the advancement of investment in open research infrastructure in Canada, such as ORCID-CA, DataCite CA, and the Canadian Foundation for Innovation. The Digital Research Alliance of Canada also cites the Roadmap in its vision for Canada’s Path to a Global Open Research Commons.

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