

ROYAL MILITARY COLLEGE

RESEARCH DATA MANAGEMENT STRATEGY

PREAMBLE

The Royal Military College of Canada is a Federal University training Officer/Naval Cadets (for the Department of National Defense) at the Undergraduate level as well as Graduate level research carried out by the Faculty Members. Due to this dual mandate of the University, the Research Data Management Strategy will have a unique flavour and answer to the high quality requirements expected by the program.

1. INTRODUCTION

The objective of this strategy is to support Canadian research excellence by promoting sound RDM and data stewardship practices. This strategy is not an open data policy. The purpose of this Research Data Management Strategy is to reinforce planning and make commitments RMC will provide to support its researchers in complying with the Tri-Agency Research Data Management Policy. For context, in 2021 the three federal research fund granting agencies—the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC), and the Canadian Institutes of Health Research (CIHR) collectively released the Tri-Agency Research Data Management (RDM) Policy. The aim of the strategy is promoting research excellence among recipients of and institutions administering Tri-Agency funds through effective data management strategies and practices.

The strategy presented in this document will be updated regularly following the results of the survey, which will be open in the Fall 2024 and will provide a more accurate assessment of the needs and requirements for researchers. Indeed, changes in network security and data access have been implemented recently and will affect the support needed in terms of research data management. Surveys will be performed regularly to ensure adequate support in terms of Research Data Management for the researchers.

1.1. WHAT IS RESEARCH DATA MANAGEMENT (RDM)?

According to the Tri-Agency Research Data Management Policy: Research data management (RDM) refers to the processes applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data. RDM is essential throughout the data lifecycle—from data creation, processing, analysis, preservation, storage and access, to sharing and reuse (where appropriate), at which point the cycle begins again. Data management should be practiced over the entire lifecycle of the data, including planning the investigation, conducting the research, backing up data as it is created and used, disseminating

Definition: Research Data Management (RDM) encompasses the processes applied throughout the lifecycle of a research project to guide the collection, documentation, storage, sharing, and preservation of research data, and allows researchers to find and access data.

data, and preserving data for the long term after the research investigation has concluded. The agencies acknowledge the diversity of models of scientific and scholarly inquiry that advance knowledge within and across the disciplines represented by agency mandates. The agencies, therefore, recognize that significant differences exist in standards for RDM—including what counts as relevant research data—among and across the disciplines, areas of research, and modes of inquiry that the agencies support.

1.2. WHY IS RESEARCH DATA MANAGEMENT (RDM) IMPORTANT?

According to the Tri-Agency Research Data Management Policy: RDM enables researchers to organize, store, access, reuse and build upon digital research data. RDM is essential to Canadian researchers' capacity to securely preserve and use their research data throughout their research projects, reuse their data over the course of their careers and, when appropriate, share their data. Furthermore, as an acknowledged component of research excellence, strong RDM practices support researchers in achieving scientific rigour and enable collaboration in their fields.

1.3. HOW SHOULD RESEARCHERS CONSIDER AND INCORPORATE SECURITY INTO THEIR RDM PLANNING?

According to the Tri-Agency Research Data Management Policy: When conducting research that involves sensitive data or has potential for dual use, researchers may need to take additional measures to balance the need for data-sharing and access with that for protection from threats. To ensure that the integrity of their research is not compromised and research results (e.g., data sets, publications, patents) are secure and protected until they choose to disseminate them, researchers should put in place good physical and cyber security practices and infrastructure. These practices should be agreed to by all research team members and partners. Canadian-led research can be an attractive target for those seeking to steal, use or adapt research for their own priorities and gain. In some scenarios, research could lead to advancements in the strategic, military or intelligence capabilities of other countries, or be used to purposely cause harm. It is, therefore, important that researchers assess and clarify the intentions of their research partners, and take reasonable, risk-based measures to safeguard their research.

NOTE: For more information on safeguarding research and conducting risk assessments, researchers should consult the Safeguarding Your Research portal.

2. CONTEXT:

2.1. RESEARCH DATA MANAGEMENT

The purpose of this Research Data Management (RDM) policy is to establish guidelines and procedures for the effective collection, storage, sharing, and preservation of research data generated or used in the course of research activities conducted. Research data management supports the effective and responsible conduct of research, including the collection, documentation, storage, sharing and preservation of research data within and beyond the

lifecycle of a given project. The policy will apply to all researchers, staff, and students engaged in research activities that involve the generation, collection, or use of data.

As detailed in the Tri-Agency document, Research data can be:

- Primary sources to support technical or scientific enquiry, research evidence in the research process; and/or
- Evidence commonly accepted in the research community as necessary to validate research findings and results.
- All digital and non-digital content have the potential to become research data.

2.2. DATA MANAGEMENT PRINCIPLES: FAIR Principles

The FAIR Principles provide guidelines to improve the findability, accessibility, interoperability and reuse of digital assets as follows:

- Findable: Data and supplementary materials are described with sufficiently rich metadata and assigned a unique and persistent identifier.
- Accessible: Metadata and data are understandable to humans and machines. Data is deposited in a trusted repository.
- Interoperable: Metadata use formal, accessible, shared and broadly applicable language to represent knowledge.
- Reusable: Data and collections have clear usage licences and provide accurate information about their provenance.

IMPORTANT NOTES: OCAP and CARE

- a. Researchers working with sensitive and/or high-risk data should also conduct risk assessments of data collection and management processes to ensure confidentiality and security of data, including after the end of the grant.
- b. Data related to research by and with First Nations, Métis or Inuit communities must be managed according to data management principles developed and approved by these communities. This includes, but is not limited to, considerations of Indigenous data sovereignty, as well as data collection, ownership, protection, use and sharing. Consult, where applicable, the First Nations Principles of Ownership, Control, Access and Possession (OCAP®), as well as the CARE Principles for Indigenous Data Governance—CARE stands for Collective benefit, Authority for control, Responsibility and Ethics.

It is also important to integrate Equity, Diversity and Inclusion principles in the Data management plan (as recommended by RMC's EDI plan and Strategic Research Plan).

2.3. REPOSITORY TOOLS

Borealis (an example of a Repository tool), is a bilingual, multi-disciplinary, secure, Canadian research data repository, supported by academic libraries and research institutions across

Canada. Borealis is a shared service provided in partnership with Canadian regional academic library consortia, institutions, research organizations, and the Digital Research Alliance of Canada, with technical infrastructure hosted by Scholars Portal and the University of Toronto Libraries.

Borealis is available to researchers who are affiliated with a participating Canadian institution or research organization and their collaborators. Researchers receive support from local academic libraries and research organizations to facilitate the deposit, publishing, sharing, preservation, and discovery of research data.

Note: Borealis is a bilingual platform (in English and French) supports open discovery, management, sharing, and preservation of Canadian research data. The Borealis repository supports the FAIR principles for scientific data management and stewardship by ensuring data are findable, accessible, interoperable, and reusable.

Others existing tools will also be assessed and presented to the faculty and researchers by library services.

3. RMC INSTITUTIONAL RESEARCH DATA MANAGEMENT STRATEGY

The RMC institutional Research Data Management Strategy is an iterative process and the draft plan will be refined over the next five years. The institutional process will actively involve all stakeholders for a staggered implementation as initiatives of the newly approved Research Strategic Plan are launched. The Office of the Vice-Principal for Research via the Advisory Committee will review the strategy annually to encompass local institutional initiatives. In practice, RMC will set up a working group consist of representatives in order to fully engage the faculty and researchers and ensure relevance of the processes. The Chair of the working group will present a plan to the Vice-Principal Research in terms of communication of the plan, training offered to researchers and updates to the RDM annually. The specific tasks in the inception of the RDM strategy can be summarized as the following tabulated sequence:

<i>Member of Working Group</i>	<i>Action</i>
<i>Office of the VPR</i>	<i>Raise awareness</i>
<i>Research Office</i>	<i>Survey Faculty/Researchers</i>
<i>A/VPR</i>	<i>Develop Workshops</i>
<i>Library Services</i>	<i>Present Training Tools</i>
<i>Research Grant Office</i>	<i>Alliance Data consistency</i>
<i>Research Security</i>	<i>Advise on Data Selection</i>
<i>Information Technology</i>	<i>Repository Storage</i>
<i>Research Ethics Board</i>	<i>Curation Protocol</i>
<i>EDI Officer</i>	<i>Assess consistency</i>
<i>Faculty Representative</i>	<i>Communication</i>

The targets of the working group and current RDM plan will include the key milestones during Year 1:

- Promote: Communicate RDM strategy to RMC researchers (Fall 2024)
- Educate: Provide access to Research Data Management Training (Fall 2024- Winter 2025)
 - Examples: Research Data Management 101 from Scholar Portal and MANTRA
- Feedback: Conduct a survey of the scopes and types of data (Fall 2024)
- Training: Providing training on main tools for data management (Winter 2025)
- Assess: Ensure compliance with Research Ethics and EDI Principles (Winter 2025)
- Evaluate: develop metrics using best practices and on the FAIR principles (section 2.2) for the evaluation of the RDM strategy (Winter-Summer 2025)
- Support: Provide hardware/cloud for maintenance and curation of data (Summer 2025)
- Guidance: Guidance and Support will be provided during the entire process (Continuous)

Year 2:

- Promote: Communicate RDM strategy to RMC researchers and updates (Fall 2025)
- Educate: Provide access to Research Data Management Training (Fall 2025- Winter 2026)
 - Recommended for new researchers
 - Expand training for all researchers (tailored to research fields)
- Training: Providing training on main tools for data management (Winter 2026)
- Assess: Ensure compliance with Research Ethics and EDI Principles (Winter 2026)
- Evaluate support and usage (hardware/cloud)
- Guidance: Guidance and Support will be provided during the entire process (Continuous)

Year 3:

- Promote: Communicate RDM strategy to RMC researchers and updates (Fall 2026)
- Evaluate with metrics developed in year 1 and survey the support provided to the researchers through the RDM strategy (Fall 2026)
- Feedback: Update the strategy to better support the research community at RMC (Winter 2027)
- Publish and communicate the new RDM strategy
- Educate: Provide access to Research Data Management Training (Fall 2024- Winter 2025)
 - Recommended for new researchers
 - Expand training for all researchers (tailored to research fields)
- Training: Providing training on main tools for data management (Winter 2027)
- Assess: Ensure compliance with Research Ethics and EDI Principles (Winter 2027)
- Support: Provide hardware/cloud for maintenance and curation of data (Summer 2027)
- Guidance: Guidance and Support will be provided during the entire process (Continuous)

4. RESOURCES

RDM Policy

- Tri-Agency RDM Policy: <https://science.gc.ca/site/science/en/interagency-researchfunding/policies-and-guidelines/research-data-management/tri-agency-research-datamanagement-policy>
- Safeguarding Research: <https://science.gc.ca/site/science/en/safeguarding-your-research>

Training

- Research Data Management 101 <https://learn.scholarsportal.info/modules/portage/rdm-101-module-1/>
- MANTRA Research Data Management Training <https://mantra.ed.ac.uk/>

Tools

- Federated Research Data Repository: <https://www.frdr-dfdr.ca/repo/>
- DMP Assistant: <https://assistant.portagenetwork.ca/>

Principles

- FAIR Principles: <https://www.go-fair.org/fair-principles/>
- First Nations Principles of OCAP: <https://fnigc.ca/ocap-training/>

Institutional Policies

- DND Open Science Action Plan: <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/open-science-action-plan.html>
- RMC Strategic Research Plan: *Approved – not yet published online*
- EDI Action Plan: <https://www.rmc-cmr.ca/en/division-graduate-studies-and-research/royal-military-college-canada-action-plan-institutional>
- Research Ethics Board: <https://www.rmc-cmr.ca/en/research/research-ethics-board>
- Library Resources: <https://borealisdata.ca/dataverse/rmc>