

# Research Data Management Institutional Strategy at Niagara College

## Background & Purpose

After consultation with key stakeholders, in March 2021, Canada's federal granting agencies (Tri-Agency) including the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Social Sciences and Humanities Research Council of Canada (SSHRC), finalized and launched the Tri-Agency Research Data Management (RDM) Policy.

The objective of this policy is to support Canadian research excellence by promoting sound RDM and data-stewardship practices.<sup>1</sup>

The key components of the RDM policy include:

- Each institution that administers Tri-Agency funding are to develop Institutional RDM Strategies (March 2023)
- Each researcher to complete Data Management Plans (DMP) for applicable grant applications (Fall 2022)
- Each institution to provide infrastructure for Data Deposits (Date TBD)

In the spring of 2022, Niagara College (NC) began the process of evaluating the current RDM landscape and set out to determine best practices for moving forward with developing a sound Institutional RDM strategy. Recognizing that much of the research completed at the College is applied research and industry-driven, much of the data developed at NC will be exempt from this policy due to legal and intellectual-property constraints. However, NC recognized that data is an important research output and is committed to developing best practices for all data developed through our research endeavors and will ensure consistency throughout our processes as much as possible.

## The Importance of Research Data and Research Data Management

As per the Tri-Agency, 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 supports the effective and responsible conduct of research and increases the ability to store, find, and reuse research data.

Since RDM considers the full lifecycle of a research project, Data Management Plans (DMP) are a vital part of research-project development. Looking at how research data will be managed before, during and upon the conclusion of the research activity at the project-development stage will ensure that data is curated in a manner that allows for proper RDM.

Having a robust RDM strategy supports all researchers in adopting RDM practices that follow the accepted best practice of the FAIR (Findable, Accessible, Interoperable, and Reusable) Principles. This results in data that is complete, accurate, and secure.<sup>2</sup>

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<sup>1</sup> <https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management/tri-agency-research-data-management-policy>

<sup>2</sup> Wilkinson, M., Dumontier, M., Aalbersberg, I. *et al.* The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* **3**, 160018 (2016).

## Definitions

*Data Management Plan:* A 'data management plan' (DMP) is "a living document, typically associated with an individual research project or program that consists of the practices, processes, and strategies, that pertain to a set of specified topics related to data management and curation. DMPs should be modified throughout the course of a research project to reflect changes in project design, methods, or other considerations".<sup>3</sup>

*Metadata:* Metadata is data about data and is the information needed to make a dataset discoverable, citable, and usable by others.

*Research:* Research is creative and systematic work that is undertaken to increase knowledge in a particular area or discipline. It involves the collection, organization, and analysis of information to increase understanding of a topic or issue.

*Research Data:* "Data that are used as primary sources to support technical or scientific enquiry, research, scholarship, or artistic activity, and that are used as evidence in the research process and/or are commonly accepted in the research community as necessary to validate research findings and results. All other digital and non-digital content have the potential of becoming research data. Research data may be experimental data, observational data, operational data, third party data, public sector data, monitoring data, processed data, or repurposed data" (Committee on Data, International Science Council).

*Research-Data Lifecycle:* The points throughout the research process where data is conceived, created, collected, manipulated, stored, shared, archived, and destroyed, where research data management practices must be considered and implemented.

*Research Data Management:* "Research Data Management refers to the storage, access and preservation of data produced from a given investigation. Data management practices cover the entire lifecycle of the data, from planning the investigation to conducting it, and from backing up data as it is created and used to long term preservation of data deliverables after the research investigation has concluded. Specific activities and issues that fall within the category of data management include: File naming (the proper way to name computer files); data quality control and quality assurance; data access; data documentation (including levels of uncertainty); metadata creation and controlled vocabularies; data storage; data archiving and preservation; data sharing and reuse; data integrity; data security; data privacy; data rights; notebook protocols (lab or field)" (Committee on Data, International Science Council).

*Researcher:* anyone conducting research on behalf of Niagara College on Niagara College property or off-site at project partner locations, and/or utilizing Niagara College and/or project partner equipment or resources. This can include, but is not limited to, College Faculty and Staff, Research Leads, Research Technicians, Research Technologists and Research Assistants.

## Scope

This strategy is relevant to all Niagara College Researchers, including Staff and Students. While this strategy is only required for publicly funded research, it is NC's practice to follow the same processes for all research to ensure consistent application of best practices. To ensure that the RDM strategy is sound,

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<sup>3</sup> Tri-Agency Research Data Management Policy, Frequently Asked Questions, Government of Canada 2021

NC will start the roll-out of RDM governance on Tri-Agency-funded research before a full roll-out across all research activities.

While research is happening across the institution, Tri-Agency-funded and applied research is housed within the Research & Innovation Division. NC’s Research & Innovation Division provides real-world solutions for business, key industry sectors, and the community, through applied research and knowledge-transfer activities. Projects are conducted that provide innovative solutions, such as producing and testing prototypes, evaluating new technologies, and developing new or improved products or processes for small- and medium-sized businesses. With funding support from various regional, provincial, and federal agencies, students and graduates are hired to work alongside faculty and staff researchers to assist industry partners leap forward in the marketplace.

Consultation with individuals from key stakeholder divisions/departments from across the institution will inform the strategy. These stakeholders may include, but are not limited to, individuals from NC Libraries, Centre for Academic Excellence, Information Technology Services, and Indigenous Education. The purpose of on-going consultation will be to solidify and implement a sound RDM strategy across the institution that meets the Tri-Agency criteria and NC needs.

NC has identified three key priorities to focus on:

1. Enhance awareness of RDM across NC by providing training, resources, and education, on the stages of the data-management lifecycle.
2. Identify the ideal state for RDM governance and work to implement the necessary processes for compliance.
3. Strive for continuous improvement through use of existing resources available provincially and nationally.

### Priority Activities

Priority	Activity
1. Enhance awareness of RDM across NC by providing training, resources, and education, on the stages of the data-management lifecycle.	<p>Develop RDM resource documents (glossary, tips &amp; tricks, FAQ, etc.)</p> <p>Develop (enhance) communication channels to ensure RDM-specific communications are reaching the appropriate individuals.</p> <p>Develop and run training workshops for NC Researchers</p> <p>Develop processes around the implementation of RDM</p> <p>Develop and run training sessions related to DMP requirements</p> <p>Develop guidelines around data-deposit requirements</p>

	<p>Provide training on use of repository tool</p> <p>Work with NC Indigenous Education to develop resources and training specific to OCAP principles (Ownership, Control, Access, Possession)</p> <p>Provide access to outside training opportunities as appropriate</p>
<p>2. Identify the ideal state for RDM governance and work to implement the necessary processes for compliance.</p>	<p>Define what is the ideal state for RDM governance at NC</p> <p>Audit current RDM practices within NC</p> <p>Determine what additional resources are required to achieve optimal RDM success (DMP Assistant, Data Repository, etc.)</p> <p>Develop RDM Working Group to evaluate what is currently being done, what the gaps are, and how to close the gaps</p> <p>Update existing NC policies and processes that are impacted by RDM (including Research Ethics Board considerations)</p> <p>Evaluate possibility of dedicated staff member to support RDM governance</p>
<p>3. Strive for continuous improvement through use of existing resources available provincially and nationally.</p>	<p>Continued membership in Ontario Colleges RDM Community of Practices</p> <p>Regular participation in webinar and training provided by the Digital Research Alliance of Canada</p> <p>Develop internal people resources to ensure they are up to date with RDM best practices and are empowered to be subject-matter experts for RDM within NC</p> <p>Look towards increasing knowledge related to data security</p>

**Ethics Considerations**

Research projects involving human participants are reviewed by the Niagara College Research Ethics Board (REB). As part of the RDM Strategy, NC will work to ensure that the REB include an ethical review of RDM strategies and DMP to ensure appropriate protections are in place for participants, where appropriate.

## Indigenous Data Considerations

Niagara College commits to complying with the OCAP principles (Ownership, Control, Access, Possession). The First Nations principles of OCAP establish how First Nations' data and information will be collected, protected, used, or shared. OCAP is a tool to support strong information governance on the path to First Nations data sovereignty. Given the diversity within and across Nations, the principles will be expressed and asserted in line with a Nation's respective world view, traditional knowledge, and protocols.<sup>4</sup>

Along with the Agencies, Niagara College acknowledges the importance of Indigenous data sovereignty and RDM principles that recognize and respect self-determination for First Nations, Inuit, and Métis Peoples, through a distinctions-based approach. Chapter 9 of the Tri-Council Policy Statement: Ethical Research Involving Humans (TCPS2) details the considerations in research with Indigenous Peoples.<sup>5</sup>

## Looking Ahead

Niagara College will work to further develop our RDM Strategy and best practices and implement the goals outlined in this living document over the next three years. Progress will be assessed periodically and the implementation plan will be revised as required. This strategy will be updated annually to include completed items and revisions.

## Additional Resources

Tri-Agency Research Data Management Policy

<https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management/tri-agency-research-data-management-policy>

Tri-Agency Framework: Responsible Conduct of Research (2021)

<https://rcr.ethics.gc.ca/eng/framework-cadre-2021.html>

Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2 (2022)

[https://ethics.gc.ca/eng/policy-politique\\_tcps2-eptc2\\_2022.html](https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2022.html)

Digital Research of Alliance Canada

<https://alliancecan.ca/en>

The First Nations Principles of OCAP

<https://fnigc.ca/ocap-training/>

CARE Principles for Indigenous Data Governance

<https://www.gida-global.org/care>

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<sup>4</sup> <https://fnigc.ca/ocap-training/>

<sup>5</sup> <https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management/tri-agency-research-data-management-policy-frequently-asked-questions#2a>