

Brock University Research Data Management Strategy

Background Information

The Government of Canada has published a [Tri-Agency Research Data Management Policy](#). This policy requires Brock University, as an institution that administers CIHR, NSERC, or SSHRC funds, to develop and publish an RDM Strategy on the Brock University website by March 1, 2023.

Brock University followed a consultative and inclusive process to develop this Strategy (see Appendix A). A list of abbreviations are in Appendix D.

Rationale for Research Data Management

A key driver of the RDM Strategy is the [Tri-Agency Research Data Management Policy](#) that requires Brock to develop and publish an RDM Strategy by March 1, 2023. More importantly, such a strategy is very likely to recognize the work the researchers are already doing in research data management and could be instrumental in having this important work recognized and supported within university structures to provide opportunities for additional training and learning from best practices to support and mentor new faculty, early career scholars, and HQP at all levels.

RDM Practices help:

- Researchers comply with Tri-Agency data management plan requirements in grant applications
- Researchers effectively plan for storage, archiving, and appropriate disposal of research materials and research data
- Researchers effectively address elements of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2, 2018)
- Researchers comply with an increasing number of journals requiring data deposit
- Research labs share data responsibly, when appropriate
- Provide training for HQP at all levels (post-graduate, graduate, and undergraduate)

Vision

To encourage maximizing the benefits of RDM practices by supporting researchers in their RDM planning through education and collaboration.

Guiding Principles

1. The RDM Strategy is not an Open Data strategy.
2. RDM practices can be used to help facilitate operationalizing Open Science practices.
3. Brock is required to have an RDM Strategy, as per the Tri-Council Policy.
4. This document is an RDM Strategy, in response to the Tri-Council Policy; it is not a policy.

5. These RDM principles to all research, and encourage adopting RDM practices regardless of funding source.
6. RDM practices help support quality research.
7. RDM practices help researchers comply with the [Responsible Conduct of Research](#), specifically around the responsibility to keep complete and accurate records.
8. RDM practices help researchers comply with ethical conduct for research. (e.g. [The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans \(TCPS 2\)](#))
9. RDM practices are important for researchers at all levels of development.
10. RDM strategy supports research culture and diversity within research while adhering to [FAIR](#) and [CARE principles](#), as appropriate.
 - According to the FAIR principles, research data should be findable, accessible, interoperable, and reusable.
 - The CARE Principles for Indigenous Data Governance add to these core data principles for the management of data that has linkages to Indigenous peoples and communities. Specifically, the management of Indigenous data must consider the following: collective benefit, authority to control, responsibility, and ethics.

RDM Strategy Objectives

There are three main objectives of this RDM Strategy:

1. Identify a Campus Wide Education and Implementation Plan for RDM
2. Identify RDM Infrastructure
3. Identify and make Recommendations for Future Directions

1. Campus Wide Education and Implementation Plan

A. Respect of the Varied Nature of RDM

Core to this policy is to respect and understand Brock's unique researcher needs, including varied researcher paradigms, disciplines, and groups. We strive to ensure custom research support materials and workshops.

Target Relevant Audiences

- Specific Faculties/Departments
- Early Career Researchers
- New Faculty orientation
- Adjunct professors
- Research Collaborators outside Brock
- Postdoctoral Fellows
- Graduate Student populations
- Senior Undergraduate populations
- Research Officers
- Research Centres and Institutes

- Indigenous researchers

B. Stakeholders

The RDM Education and Implementation Plan needs to include individuals who 1) directly engage in research and 2) who support the research enterprise and/or academic mission of the university. We have identified several stakeholder communities within Brock and the current research support and infrastructure in place.

- Researchers:
 - o Researchers within Brock (e.g. Faculty, Emeritus, Adjunct, Librarians)
 - o Research Collaborators outside Brock
 - o Highly Qualified Personnel (HQP – postdoctoral fellows, graduate students, undergraduate students)
 - o Undergraduate and graduate students
 - o Indigenous Researchers
- Research and Education Support:
 - o Brock Library
 - o Office of Research Services
 - o Office of Research Ethics
 - o Office of The Vice-President Research
 - o Research and Scholarship Policy Senate Committee
 - o Information Technology Services
 - o Faculty of Graduate Studies
 - o Brock LINC
 - o Centre for Pedagogical Innovation
 - o Two Row Council
 - o Aboriginal Education Council (AEC)
 - o Hadiya'dagénhahs First Nations, Métis and Inuit Student Centre
 - o Animal Care Services
 - o BUSU
 - o GSA

C. RDM Champions

This strategy identifies experts across campus, to help promote the value of RDM and engage with various communities.

1. The RDM Strategy Working Group, who is tasked with developing Brock's Institutional Strategy, is comprised of researchers in different disciplines as well as individuals from a diversity of units who support Brock's research endeavors.
2. Any future Brock RDM Team should be comprised of researchers in different disciplines as well as individuals from a variety of units who support Brock's research endeavors to ensure diversity that is representative of varied research communities and those who support the research within the university.
3. Provide support and training for individuals who support research activity on campus. Ensure all the individuals supporting research and associated infrastructure on campus (e.g. research

officers, library staff) are adequately trained and confident in communicating RDM processes and resources.

4. Identify local champions within each Faculty and within specialized research groups as necessary. There will be regular communication with these research leaders on campus, including asking them for ideas on how to support research teams.

D. Materials and Resources provision

This strategy identifies that providing awareness of materials and resources is crucial for an overall understanding of RDM on campus. See Appendix B for a list of resources available. The RDM Team will:

1. Continue to evolve and maintain library-related guides, modules, and resources.
2. Ensure that research guide content is varied and reflects the diverse nature of data and researcher communities.
3. In collaboration with Marketing and Communications (MarComm), develop Brock-specific video testimonials
4. Leverage existing resources from partners and collaborators.
5. Collaborate with ITS to ensure mutual understanding of RDM practices that are supported by ITS versus the Library; ensure clarity of communication regarding what services and resources are available where.

E. Varied Outreach Mechanisms for Delivery

This strategy considers different delivery mechanisms for outreach including various in person and online resources and events. This can include the following:

Workshop Development

- General Library Workshops (Library)
- Building Better Research Workshop Series (Library & ORS)
- FGS Programming for Graduate Students
- Custom workshops for different researcher (or research support) groups on campus
- Modules on RDM to be used in undergraduate and graduate classes

Website Content

- One primary website landing point with links to resources to provide one main RDM location (Library)
- Research Guides (Library)
- Include videos, links, etc.

Communication of Guides/Workshops

- Brock Library blog posts (library)
- Social media (Library)
- ORS News Bulletins (Library & ORS)
- Brock News (Library in collaboration with MarComm)

Development of Additional Resources

- RDM videos (faculty and students – contest for student RDM videos)
- Share existing practices
- Develop better internal data storage practices (e.g. Freezer Farm, storage rooms, labs)
- Brock News (Library in collaboration with MarComm)

Leverage Research Networks to Share Information

- Participate in Faculty and departmental meetings
- Participate in research-centred units/group meetings
- Participate in appropriate Senate-related meetings

Creatively Engage Research Communities through Events

- Lead and facilitate events (e.g. campus-wide Data Day)
- Build RDM Community of Practice, considering varied partners & contexts on campus
- Lead and facilitate student RDM contests

2. RDM Infrastructure Identification

RDM is supported across multiple departments on campus, including the Library, ITS, and the Research Enterprise. We reviewed four elements of infrastructure on campus including policies and procedures, technology infrastructure, services and support, and financial support. Library, ITS, and the Research Enterprise all play a role in supporting RDM infrastructure.

A. Policies & Procedures

The development of this Institutional RDM Strategy focuses on communication, outreach, and education about RDM. The intention of this strategy is to provide a shared understanding of the process Brock will follow to support and coordinate RDM practices on campus. See Appendix C for a list of relevant policies. The key to successful implementation of an Institutional RDM Strategy is based on communication and outreach, is to understand relevant unit-level policies and procedures, and to help develop a shared understanding of what is happening on campus. RDM is happening on campus, but it is inconsistent and unit-dependent.

Some examples of policies and procedures on campus at Brock: a Responsible Conduct of Research policy that includes data, the Faculty of Graduate studies has an Intellectual Property Checklist that includes the ownership of data. While Brock does consider intellectual property, ethics, retention schedules, security and risk assessments as it relates to data, data sharing agreements, data storing and preserving, these are implemented inconsistently, without coordination, and with duplication of effort.

B. Services & Support

Currently, the Library is providing leadership for training and consultation for RDM (general RDM, DMP's, data curation). RDM Services and Support can be strengthened with a continued collaborative effort between Library, ITS, and the Research Enterprise. The Library for example, has a Data Services Librarian who offers workshops, training, and consultations in this area. ITS can provide training and support for using technology for data analysis. The Research Enterprise can play a role in supporting RDM as Research Officers support grant writing (of which RDM is a part), and the Office of Research Ethics also plays a role through the REB process (e.g., retention processes).

While Brock offers training and consultations for RDM, RDM services are not widely known. Further, there are opportunities for coordination and collaboration between Library, ITS, and the Research Enterprise to improve services and support in RDM. Perhaps more important, collaboration might

C. Financial Support

RDM has two primary areas requiring financial support – resource allocation for HR capacity and resource allocation for infrastructure. In terms of resource allocation for HR capacity there are some positions that touch on RDM in ITS, the Library, and the Research Enterprise. However, the current resources are insufficient to support RDM needs given the implications of the [Tri-Agency Research Data Management Policy](#). Additionally, the current resources are located across the three areas with no formal mechanism connecting them. Each of these areas will require purposeful allocation (and/or addition) of resources, as well as creating a network to link the individuals with these responsibilities, to support a successful implementation.

The other key to successful implementation is investment in resource allocation for general RDM infrastructure. This includes items such as service development, training, and specific infrastructure related to storage (e.g. cost for storage, including post project longer term storage), necessary software, and data security. One of the difficulties in this area is that support of this level of infrastructure is essential to successful implementation but the specifics of what will be needed will only be identified through active implementation as we discover the specific research needs and the most appropriate solutions.

Technology Infrastructure

There are several infrastructure elements and services that are currently operationalized and available to researchers upon request. ITS currently provides access to the following: secure data storage, including RBAC (role-based access control); private digital space for researchers to collaborate on research projects; multiple solutions for file transfer service that have some ability to be tailored to individual needs. Some infrastructure is still under development or specific to researcher needs. For example, high performance computing is under development by ITS but can be accessed through the two SharcNet representatives on campus (Research Enterprise) and via access to Compute Canada.

Infrastructure focused on data deposit, preservation, and archival storage also exists and is generally offered through the Library and through ITS. Specifically, data repositories are available through OCUL, ScholarsPortal (Borealis: The Canadian Dataverse Repository), and through Alliance (FRDR). If the data are of a sensitive nature, there are multiple solutions available through ITS that are dependent on requirement/needs. Customized solutions are also possible upon request although advance planning is needed due to the time and development associated with customized solutions. FRDR can handle some sensitive data (e.g., embargo) but Borealis does not accommodate sensitive data. In terms of preservation and archival storage, the Library has the technical process in place to do archival preservation, but so far this has not been applied to research data. There are also possibilities through the Ontario Library Research Cloud (OLRC) through OCUL Scholars Portal.

Future Directions & Recommendations

We recommend that Brock creates a Brock RDM Team that includes relevant expertise from across campus. This team shall have the following responsibilities:

- To operationalize the campus-wide education and implementation plan.
- To monitor, advocate, and build capacity in Brock's RDM Infrastructure.
- To strategize the implementation of appropriate resources for RDM engagement across the three primary supports (i.e., Library, ITS, and Research enterprise).
- To promote RDM as a collaboration across campus, and to make it easy for researchers to understand who can provide expertise and infrastructure.
- To help identify RDM-related policies and procedures on campus, to help provide a shared understanding of campus activity.
- To develop and implement a campus-wide data records and storage system for research data and artifacts.
- To complete the MAMIC (or comparable) tool every two years, to ensure evaluation of RDM on campus.
- To review the education and implementation strategy annually.
- To provide an annual report to Research & Scholarship Policy, copied to the Provost and VPR.
- To engage in two-way conversations and with national collaborative efforts in RDM (e.g. Digital Research Alliance of Canada).
- To engage in two-way conversations with Tri-Agency consultations about RDM.

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Appendix A: Process for Building the RDM Strategy

1. Group Membership & Governance

Reporting to the Research and Scholarship Policy Senate Committee, the RDM Strategy Working Group is a diverse team responsible for leading the development of Brock's RDM Strategy. This Working Group was formed on October 2020. This team included the following members:

1. Vincent Annibale - Research Officer, Office of Research Services
2. Jeffrey Boggs - Associate Professor, Geography & Tourism Studies
3. Robyn Bourgeois - Vice-Provost, Indigenous Engagement
4. Danusha Kalinga - Research Officer, Office of Research Services
5. Sinéad McElhone - Niagara Region Public Health
6. Michelle McGinn - Associate Vice-President, Research
7. Sam Montana - IT Manager, Data Architect
8. Nicole Nolan - Associate University Librarian, Research (Co-Chair)
9. Randy Peterson – Business Development Officer, Innovation & Commercialization (ORS)
10. Tim Ribaric – Digital Scholarship Librarian
11. Mark Robertson - University Librarian
12. Valdeep Saini - Assistant Professor, Applied Disability Studies
13. Liette Vasseur - Professor, Department of Biological Sciences
14. Lori Walker - Manager, Research Ethics
15. Shiloh Williams - GIS and Data Services Librarian
16. Dawn Zinga - Associate Dean, Faculty of Social Science (Co-Chair)

2. Reviewed Support Materials from the Digital Research Alliance of Canada

The [Digital Research Alliance of Canada](#) provides services including a Federated Research Data Repository ([FRDR](#)), the Data Management Plan ([DMP](#)) [Assistant](#), [learning and training materials](#), and [various publications](#).

Our group process included reviewing materials so we could as a team, build a shared understanding of research data management. Early on, we used the [Institutional RDM Strategy Development Template](#) that helped give our working group some structure and guidance as we grappled with understanding what RDM means for Brock University.

3. Workshop Attendance

Several Brock University RDM Strategy Working Group members attended an RDM Workshop led by the Digital Research Alliance of Canada. This workshop, "Putting the Policy into Practice" was on the Institutional Strategies requirement of the Tri-Agency RDM policy. This workshop was helpful as it gave our Working Group some more guidance, an opportunity to ask more questions, and to meet with others across the country who are working on their own strategies.

4. Reviewed DMP Examples

Our Working Group reviewed the DMP tool for a variety of different subject areas. We also invited two research labs to fully utilize the DMP, and debrief our working group on the process. This gave the working group the opportunity to ask questions and get a better understanding of the challenges and opportunities involved with using the DMP.

5. Survey

Led by Brock's Data Librarian Heather Whipple, we conducted a Research Data Management Faculty & Postdoctoral Survey in 2020. We used an [existing survey tool](#) developed by the Canadian RDM Survey Consortium, that looks at RDM practices on campus.

There were 56 individuals who participated in the survey. These individuals included representation from faculty members (50), instructors (2) librarians (1), postdoctoral fellows (1), professor emeriti (1), and research centre coordinators (1). Each of the faculties were also represented (Goodman School of Business, 9; Faculty of Applied Health Science, 8; Faculty of Education, 1; Faculty of Humanities, 9; Faculty of Math and Sciences, 7; Faculty of Social Sciences (22). There was also representation from the following research centre and institutes: Advanced Biomanufacturing Centre, Centre for Digital Humanities, Centre for Sport Capacity, Cool Climate and Viticulture Institute, Environmental Sustainability Research Centre, Humanities Research Institute, Lifespan Development Research Institute, Niagara Community Observatory, Posthumanism Research Institute, and Social Justice Research Institute. Collectively, those who participated had experience with a broad range of funding agencies and research programs including at the tri-agency level, other federal, national and local funding avenues as well as Ontario Early Career research program, Canada Research Chair program, and the Chancellor Chair program.

The survey was designed to provide a snapshot of where Brock researchers were in terms of their knowledge and understanding of RDM practices. The survey results provides insight into how researchers are handling RDM associated tasks and their overall knowledge and contributions to training in the area. It also included information round researchers' understandings of and attitudes towards open science and data sharing. It is interesting to note that half of the participants indicated that while they felt able to complete DMPs as part of grant application they would prefer being able to access assistance or guided documentation to support the success of that part of their application. The other half of the participants indicated that they would need to access assistance or guided documentation to appropriately complete DMP sections. This points to a clear need for resources and supports around the development of DMPs. The survey results also pointed to a need for DMP education for HQP as none of the respondents indicated that they taught any material related to DMP. While the survey did not address in-lab or research-oriented training around DMP, there is clearly room within the academic mission of the university to include DMP content at the graduate and undergraduate levels.

6. Learned about Indigenous Data

We learned from Robyn Bourgeois, Vice-Provost Indigenous Engagement, about the complexities of RDM associated with research and the resulting data when working with Indigenous individuals and communities. The committee continued to have discussions about sensitive data throughout the process.

7. RDM Maturity Assessment Tool in Canada (MAMIC) Tool

Our working group used the [MAMIC tool](#) to help inform Brock's state of readiness for implementing and RDM program that appropriately supports researchers. Each member of the working group reviewed and contributed to a shared document, independently. We then spent time over the course of four meetings, reviewing each of the four categories (Institutional Policies and Process, IT Infrastructure, Support Services, Financial Support) as a group.

8. Reviewed other Strategies

Although our RDM Strategy is meant to be customized to the Brock Context, our working group found it helpful to review other institutions' RDM Strategies.

9. Communication

- This strategy was collaboratively written and reviewed by the RDM Strategy Working Group
- Updates throughout the process were given to Research & Scholarship Policy
- This Strategy went to Research and Scholarship Policy (for "decision?, information?)"
- Went to Senate for Information (I assume information....)
- Consultations?

10. WG Closure & Recommendations for Implementation

After approval at Senate, the work of this working group is complete. We recommend a new group be formed, a Brock RDM Team to help support the implementation of the RDM Strategy for Brock University.

Appendix B Resources Available

[Brock Library Research Guide on RDM](#)

[DMP Assistant](#)

[Digital Research Alliance of Canada Training Resources](#)

Appendix C Institutional Policies and Processes

[Responsible Conduct of Research](#)

[Graduate Studies Intellectual Property \(Ownership of Data\)](#)

[Tri-Agency Ethical Conduct for Research Involving Humans](#)

Appendix D Abbreviations

BUSU – Brock University Student Union

CIHR – Canadian Institutes of Health Research

DMP – Data Management Plan

FRDR – Federated Research Data Repository

GSA – Graduate Student Association

HR – Human Resources

HQP – Highly Qualified Personnel

ITS – Information and Technology Services

MAMIC - RDM Maturity Assessment Model in Canada

NSERC – Natural Sciences and Engineering Research Council of Canada

OCUL – Ontario Council of University Libraries

OLRC - Ontario Library Research Cloud

RDM – Research Data Management

SSHRC – Social Sciences and Humanities Council of Canada

WG – Working Group