BACKGROUND

Mandate

Recognizing the importance of strong research data management (RDM) practices for high-quality research, in 2017 the Tri-Agency issued the [Tri-Agency Research Data Management Policy](#), which required all institutions eligible to administer Tri-Agency funds to prepare and publish an Institutional RDM Strategy by March 2023 (Nipissing University received an extension to September 1, 2023).

Principles

This Strategy recognizes and affirms the principles that guide the Tri-Agency's RDM Policy:

- Foundationally, data are an important research output.
- Strong research data management:
  - is a key element of research excellence;
  - makes data more archivable, discoverable, accessible, reusable, and secure;
  - recognizes that a distinctions-based approach is needed to ensure that the unique rights, interests and circumstances of the First Nations, Métis, and Inuit are acknowledged, affirmed, and implemented and that data created with and by Indigenous communities, collectives, and organizations is managed based on their principles, with their approval, and in partnership with them;
  - requires that institutions support the management of their researchers' data;
  - requires that institutions promote best practices in research data management with their researchers, staff, and students through education and facilitation of the creation and implementation of data management plans;
  - requires that institutions develop policies that are consistent with ethical, legal, and commercial obligations, including Tri-Agency and community requirements and policies;
  - equips researchers for collaboration in international projects; and
  - fosters more data sets cited and more researchers from Canadian universities recognized.

Commitments

In developing this Strategy and the corresponding policies, resources, and processes that will follow, Nipissing University commits to basing its policy and best practices on established standards of research data management, as articulated in the Tri-Agency's RDM Policy, global, national, and regional ethical standards, as well as community engagement and data management principles for data involving Indigenous peoples, communities, and lands. Recognizing that these standards will evolve, Nipissing will review and revise its Strategy as RDM services, infrastructure, and practices evolve.

Scope of Strategy

The Institutional RDM Strategy is relevant to all NU faculty, staff, students, collaborators, and other partners engaged in research linked to Nipissing University. Strong scholarly inquiry involves shared responsibility and care for research data throughout the lifecycle of a research project. Within this context, NU has a responsibility to provide a research environment that supports researchers in this endeavour. This includes providing educational opportunities, resources, and supports that empower researchers to engage in best practices for RDM. Researchers and their trainees have a responsibility to abide by relevant research policies (e.g., [Responsible Conduct of Research,](#) [Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – TCPS 2,](#) [institutional research-related policies](#)), to conduct research using best practices and current guidelines, both within their field and for their chosen modes of inquiry, and to continue their learning as practices and guidelines evolve over time. Engagement in appropriate RDM practices is required for research

funded by the Tri-Agency; however, principles and best practices should also be applied to all forms of research, regardless of funder or funding status. Principles and practices supported through this Strategy may be applied for managing data that falls outside the scope of the Strategy.

Oversight & Review

- Accountability for the Strategy and its implementation resides in the Provost & Vice-President, Academic's (VPA) office. The administration of the Strategy and development of the deliverables that result from the implementation process are a responsibility shared with the Associate Vice-President Research, Innovation, and Graduate Studies' (AVP RIGS) office, related committees (e.g., Senate Research Committee), and the NU Research Ethics Board. Other departments and committees may take a leadership role in some aspects of Strategy implementation, as appropriate. The Provost & VPA will assign the lead department on specific initiatives.

- The Strategy will be reviewed after year 1, then every three years. Implementation plans will be reviewed annually.
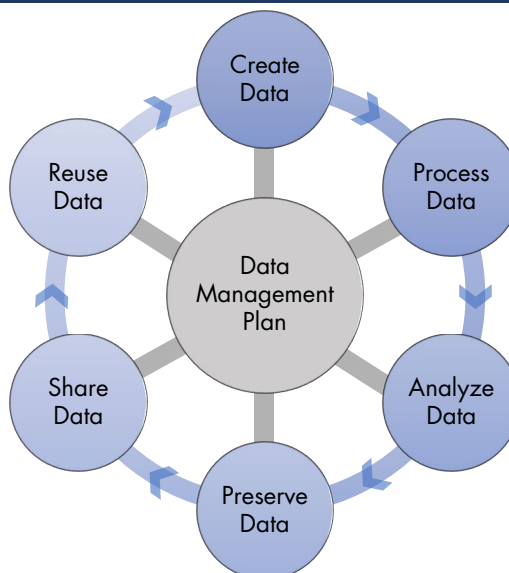
TRI-AGENCY DEFINITIONS

What is research data management?

Processes applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data.

Data management plan (DMP)

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 can and should be modified throughout the course of a research project to reflect changes in project design, methods, or other considerations.

Data	facts, measurements, recordings, records, or observations collected by researchers and others, with a minimum of contextual interpretation. Data may be in any format or medium taking the form of text, numbers, symbols, images, films, video, sound recordings, pictorial reproductions, drawings, designs or other graphical representations, procedural manuals, forms, diagrams, workflows, equipment descriptions, data files, data processing algorithms, software, programming languages, code, or statistical records.
Research data	data used as primary sources to support technical or scientific enquiry, research, scholarship, or creative practice, 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. Research data may be experimental data, observational data, operational data, third party data, public sector data, monitoring data, processed data, or repurposed data. What is considered relevant research data is often highly contextual and determining what counts as such should be guided by disciplinary norms.
Data deposit	when the research data collected as part of a research project are transferred to a research data repository to preserve the data, and where applicable, provide access to the data.

	Data deposit ideally includes information about the context in which data was collected and used.
Metadata	data that define and describe the characteristics of other data. Accurate and relevant metadata are essential for making research data findable. A principle to help determine what information should be included in metadata is the open archival information system model criterion that the information be "independently understandable."
FAIR principles for scientific data management and stewardship	**Findable**: Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of data sets and services. **Accessible**: Once the user finds the required data, the user needs to know how data can be accessed, possibly including authentication and authorization. **Interoperable**: The data usually need to be integrated with other data. In addition, the data need to be interoperable and able to function with applications (including computer software and hardware) or workflows for analysis, storage and processing. **Reusable**: The ultimate goal of FAIR is to optimize the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings. FAIR principles are complemented by the CARE principles for Indigenous Data Governance. FAIR principles do not supersede Indigenous data sovereignty or other cultural, ethical, legal, or commercial considerations.

STRATEGY DEVELOPMENT PROCESS

An RDM Working Group was formed at Nipissing in 2018, composed of members from groups within the NU community, including the Learning Library, Faculty Researchers, Institutional Planning & Analysis, the Research Data Centre, University Technology Services (UTS), and the Nipissing University Research Ethics Board.

In 2019, this group distributed a survey to all faculty, postdoctoral fellows, and graduate students with the purpose of identifying the current state of RDM awareness and practices at Nipissing. The results of the survey helped to inform the institutional action steps identified in the following Objectives section. Broadly speaking, the results established a baseline for

- how NU researchers manage and share research data throughout and beyond the duration of their projects; and
- differences in research data management practices and needs across disciplines.

The Working Group used this snapshot of the 'current state' of RDM, as well as feedback from the consultation process, to identify gaps and establish a plan for moving RDM forward at Nipissing, throughout the entire data lifecycle.

The consultation process involved discussions with the Indigenous Community Engagement Plan committee and senior administration. The Strategy was shared with the Faculty Council Executive teams, heads of departments identified within the Strategy, and the broader NU campus community, which includes faculty, postdoctoral fellows, students, and staff, with an opportunity for individuals and departments to provide feedback via an online form.

The final Strategy was reviewed by the Senate Research Committee and executive team prior to publication and submission to the Tri-Agency.

CURRENT STATE

Descriptive information gathered through the 2019 RDM campus survey identified several areas of initial focus for RDM supports:

- Guidance on developing Data Management Plans (DMPs)
- Resources to support learning about use and availability of repositories
- Opportunities to explore concerns about data sharing and open access
- Continuing education opportunities related to best practices for RDM among faculty and graduate students

OBJECTIVES

Having assessed the current state of RDM at NU, this section identifies the mandated Tri-Agency standards and the steps required by NU to meet these standards. The overarching goal is to foster a culture of strong RDM awareness and practice at Nipissing. To achieve this objective, NU's Institutional RDM Strategy addresses 3 specific areas: data management plans, data deposit and access, and research with Indigenous peoples, communities, and lands. The Strategy also identifies the departments who may play a leadership role in completing specific steps. The list of collaborators is not meant to be exhaustive; rather, it will evolve as implementation plans are developed. Participation in working groups and input from faculty, staff, and other members of the NU community is important for achievement of the steps.

1 | DATA MANAGEMENT PLANS

Tri-Agency Requirements:

All grant proposals submitted to the agencies should include methodologies that reflect best practices in RDM. For certain funding opportunities, the agencies will require DMPs as part of the application; in these cases, the DMPs will be considered in the adjudication process.

DMPs should cover:
- how data will be collected, documented, formatted, protected and preserved;
- how existing datasets will be used and what new data will be created over the course of the research project;
- whether and how data will be shared;
- where data will be deposited;
- who is responsible for managing the data, including a succession plan; data-related roles of other team members;
- ethical, legal and commercial constraints the data are subject to and methodological considerations that support or preclude data sharing; and
- for Indigenous research, recognition of Indigenous data sovereignty and options for DMP renegotiation.

Institutional steps to support this requirement	Collaborators
1.1 Identify resources and existing gaps to support RDM	Research Services Learning Library NU Research Ethics Board (NUREB)

1.2	Increase RDM resources available to researchers on the library website (e.g., LibGuides)	Learning Library
1.3	Develop NU guidelines for RDM, including guidance for researchers on DMPs and using the DMP Assistant	Research Services Learning Library
1.4	Review current processes for vetting DMPs through NUREB's ethical review and augment these as needed; map administrative processes for ensuring compliance with the RDM policy	NUREB & Indigenous Community Engagement Plan (ICEP) Committee Research Services Learning Library University Technology Services (UTS)
1.5	Develop training strategies for researchers and staff (online modules, handbooks, etc.) to communicate the RDM policy and best practices to researchers through various media (e.g., email, Research newsletter, website content)	Research Services Learning Library NUREB Teaching Hub

2 | DATA DEPOSIT & ACCESS

Tri-Agency Requirements: Tri-Agency grant recipients are required to deposit into a digital repository all digital research data, metadata and code that directly support the research conclusions in journal publications and pre-prints that arise from agency-supported research.

Other guidelines:
- Deposit must be made by time of publication.
- The repository must ensure safe storage, preservation and curation of the data.
- Researchers are not required to share their data, but are expected to provide appropriate access to the data where ethical, cultural, legal and commercial requirements allow.
- Data, metadata, and code should be linked to the publication with a persistent digital identifier, whenever possible.
- Disciplinary norms should guide what information is considered relevant research data and which data should be preserved.
- For Indigenous research, recognition of Indigenous data sovereignty could result in exceptions to data deposit requirements.

	Institutional steps to support this requirement	Collaborators
2.1	Document data repositories currently available to researchers (e.g., institutional repository, Borealis, FRDR)	Learning Library
2.2	Identify any additional data repositories needed to support data deposit adequately and securely for research at NU and acquire access	Learning Library UTS Research Services

2.3	Establish administrative processes for supporting research data deposit, including ensuring the security of the data	Learning Library Research Services UTS NUREB
2.4	Develop a workflow for determining appropriate access to data based on ethical, cultural, legal, and commercial requirements	Research Services NUREB Learning Library
2.5	Develop training resources for researchers, including a LibGuide on RDM	Learning Library Research Services

3	RESEARCH WITH INDIGENOUS PEOPLES & COMMUNITIES

Tri-Agency Requirements:	For research conducted by and with First Nations, Métis and Inuit communities, collectives and organizations, DMPs must be co-developed with these communities, collectives and organizations, in accordance with RDM principles or DMP formats that they accept.
Other Guidelines:	- DMPs should recognize Indigenous data sovereignty and include options for renegotiation of the DMP - The communities, collectives or organizations will guide and ultimately determine how the data are collected, used and preserved, and have the right to repatriate the data - This process could result in exceptions to the data deposit requirement - DMP formats should be flexible to reflect the differences across Indigenous communities - Discussion of DMPs should be included within researchers' Indigenous Community Engagement Plans (ICEP)

	Institutional steps to support this requirement	Collaborators
3.1	Engage with regional Indigenous communities and organizations, as well as guidelines established by Indigenous groups globally (e.g., CARE), nationally (e.g., OCAP) and regionally (e.g., USAI, GEAR), to identify existing resources as well as gaps Identify the institutional contact to liaise between NU and Indigenous communities, organizations, and collectives with respect to research processes and practices	Research Services NUREB Office of Indigenous Initiatives (OII) Learning Library
3.2	Co-develop processes and resources to guide RDM with Indigenous communities to ensure that guidelines for DMPs are consistent with existing RDM guidelines	Research Services NUREB OII Learning Library

3.3	Support educational opportunities for researchers to learn about protocols for engaging with Indigenous communities in a good way	Research Services NUREB Learning Library Teaching Hub
3.4	Review current forms and assessment processes for DMPs and Indigenous Community Engagement Plans (ICEPs), to ensure that strong RDM plans are integrated into both Develop forms that are accessible to Indigenous communities to support RDM discussions throughout the research process	NUREB OII (ICEP Committee) Research Services
3.5	Review current processes for ensuring compliance with DMPs and update or develop them as needed	Research Services NUREB OII (ICEP Committee)
3.6	Identify processes for data deposit to provide pathways for recognition of research and IP agreements, as well as renegotiation of agreements	Learning Library Research Services
3.7	Incorporate guidance on approaching RDM with Indigenous data into RDM and DMP training and documentation	Research Services Learning Library OII (ICEP Committee) Teaching Hub

IMPLEMENTATION TIMELINE

Implementation of the Strategy will be an iterative process, occurring over multiple years.

- The Provost & VPA and the AVP RIGS will identify specific policies and resources required for Strategy implementation and will work collaboratively with the executive team and key collaborators to create timelines for implementation of the institutional steps. The goal is for a detailed timeline to be established in 2023-2024.
- As part of a collaborative implementation process, an RDM implementation working group will be formed under the purview of the Senate Research Committee. This working group will be tasked with development of the processes related to implementation of the Institutional RDM Strategy. For transparency and to support ongoing professional development and consultation processes, implementation of the Strategy will include a forum for sharing the work towards implementation and a process for establishing annual RDM priorities and engaging in discussions and continuing education related to RDM practices (e.g., annual summit).
- The RDM sub-committee should aim to include members from, and engage in consultation with, diverse groups within the larger NU community. This includes individuals from departments listed as collaborators in the Strategy objectives, as well as faculty, students, and community and research partners.

STANDARDS & RESOURCES

Policies & Best Practices
Tri-Agency Research Data Management Policy
Tri-Agency Research Data Management Policy - Frequently Asked Questions
Tri-Agency Statement of Principles on Digital Data Management
Tri-Agency Framework: Responsible Conduct of Research
Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans
CIHR's Health Research and Health-Related Data Framework
Tri-Agency Open Access Policy on Publications

Indigenous Data Governance
First Nations Principles of Ownership, Control, Access, and Possession (OCAP)
CARE Principles for Indigenous Data Governance
Utility, Self-Voicing, Access, and Inter-Relationality (USAI): Research Framework
Guidelines for Ethical Aboriginal Research (GEAR)
Nipissing First Nation Research Policy

Resources & Repositories
Digital Research Alliance of Canada – RDM Resources
Borealis (The Canadian Dataverse Repository)
Federated Research Data Repository

Tools for Researchers
DMP Assistant
Digital Research Alliance's Training Resources & DMP Templates
Carleton's RDM Webinar Series