UNIVERSITY OF
CALGARY

Research Data Management Strategy
March 2023

Research Data Management Strategy

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The University of Calgary, located in the heart of Southern Alberta, both acknowledges and pays tribute to the traditional territories of the peoples of Treaty 7, which include the Blackfoot Confederacy (comprised of the Siksika, the Piikani, and the Kainai First Nations), the Tsuut'ina First Nation, and the Stoney Nakoda (including Chiniki, Bearspaw, and Goodstoney First Nations). The City of Calgary is also home to the Métis Nation of Alberta Region III.

The University of Calgary is situated on land Northwest of where the Bow River meets the Elbow River, a site traditionally known as "Moh'kins'tsis" to the Blackfoot, Wîchîspa to the Stoney Nakoda, and Guts'ists'i to the Tsuut'ina. On this land and in this place we strive to learn together, walk together, and grow together "in a good way."

Foreword

I am very pleased to share with you the University of Calgary's inaugural Research Data Management Strategy. As our response to the Tri-Agency Research Data Management Policy, this Strategy lays out UCalgary's commitment to supporting our research community's use of good research data management (RDM) practices in all research activities. The Strategy is also the roadmap that we will use to develop our institutional approach to RDM over the next months and years.

UCalgary believes that there are real and tangible benefits of RDM at the level of the individual research project, including increasing the rigour, transparency, and efficiency of research, as well as reducing costs. Employing best practices in RDM also allows researchers to share their research data more effectively, where such sharing is permitted and appropriate, to allow future research that builds on those data. In short, we know that good RDM practices make research better and accelerate the expansion of knowledge.

We also know that implementing good RDM practices takes time, resources, and support. This Strategy will be UCalgary's guide in developing the institutional policies and processes, IT infrastructure, and support services needed to scaffold and support our researchers' RDM practices. We will ensure that our researchers and students have the knowledge, training, and resources they need to implement RDM in their work; that our staff have the knowledge and capacity to support our researchers; that our infrastructure is up to date and scalable; and that our policies and procedures provide clear guidelines and requirements. All of this will help us to grow a culture that embraces RDM at UCalgary.

The UCalgary RDM Strategy does not stand alone, but intersects with many of our existing strategies, initiatives and practices, including our current strategic planning efforts, our Research Plan, our Indigenous Strategy *ii'taa'poh'to'p*, and our many equity, diversity, and inclusion initiatives. Together, this framework allows UCalgary researchers to conduct excellent, impactful research.

I would like to take this opportunity to thank the members of the RDM Strategy Steering and Working Committees, as well as members of our research community who attended workshops, completed our survey, or otherwise engaged in feedback-gathering and consultations, for their hard work over the past year in developing this inaugural strategy. Their work, codified in this Strategy, has laid the foundation for UCalgary to create a robust culture of good RDM practices and a scalable support system for those practices.

Dr. William Ghali
Vice-President (Research)
University of Calgary

Introduction

Research data management (RDM) is the range of processes and procedures "applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data"[1]. All academic researchers who work with research data apply these processes and procedures in their work in a variety of ways and with varying levels of formality. Given recent developments in the research landscape – including the open science movement, drives for transparency and reproducibility, concerns about privacy and security, and increasing research costs – academic research is now at a point where it is crucial to recognize the importance of research data and commit to implementing and supporting best practices in RDM.

In March 2021, the Tri-Agencies released their Research Data Management Policy, which applies to all post-secondary institutions and research hospitals that are eligible to administer SSHRC, NSERC, or CIHR funds, and to all researchers holding grants from those agencies. This Policy rests on three pillars:

1. Institutional Research Data Management (RDM) Strategies: "Each postsecondary institution and research hospital eligible to administer CIHR, NSERC or SSHRC funds is required to create an institutional RDM strategy and notify the agencies when it has been completed." (section 3.1 of the Policy). These strategies must be completed by March 1, 2023.

2. Data Management Plans: "All grant proposals submitted to the agencies should include methodologies that reflect best practices in RDM. For certain funding opportunities, the agencies will require data management plans (DMPs) to be submitted to the appropriate agency at the time of application, as outlined in the call for proposals; in these cases, the DMPs will be considered in the adjudication process" (section 3.2 of the Policy). The initial funding opportunities requiring DMPs were launched in the fall of 2022, and additional programs with this requirement will roll out over the coming weeks and months.

3. Data Deposit: "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.... The deposit must be made by time of publication" (section 3.3 of the Policy). This requirement will be implemented after the Tri-Agencies have reviewed the published institutional strategies and "in line with the readiness of the Canadian research community" (section 4 of the Policy).

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[1] "1d: What is research data management?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy*, last accessed July 13, 2022 at https://www.science.gc.ca/eic/site/063.nsf/eng/h_97609.html#1d

This Research Data Management Strategy (the Strategy) represents the University of Calgary's acknowledgement of the importance of RDM and commitment to supporting our research community's use of good RDM practices in all research activities. It is also the roadmap that UCalgary will use to develop our institutional policies and processes, IT infrastructure, and support services for RDM over the next months and years. The Strategy thus has four purposes:

1. To embody the University of Calgary's commitment to meeting the institution-facing requirements of the Tri-Agency RDM Policy and enabling our research community to meet the researcher-facing requirements of the Policy.

2. To allow the University and our research community to address the RDM requirements and obligations being implemented by other funders—such as the Canada Foundation for Innovation, the U.S. National Institutes of Health, and the U.S. National Science Foundation—as well as those being driven by changes in academic publishing and in academia more broadly.

3. To establish a foundation on which we will build a culture of good research data management practices for current and future generations of researchers.

4. To establish a foundation for discussions about research data management with our research participants and partners, including partners from government, industry, community organizations, and Indigenous communities.

Guiding Principles

The creation and implementation of this Strategy have been informed by four guiding principles:

Research Excellence and Impact

The University of Calgary's RDM Strategy plays an essential role in sharpening our focus on research and scholarship and allowing us to drive innovation, which are key priorities of our *Eyes High* Strategy and Research Plan. The RDM Strategy also recognizes, respects and supports the strategies and initiatives which embody the shared values and practices underpinning all work at the University, including *ii' taa'poh'to'p*, the University of Calgary's Indigenous Strategy; and equity, diversity and inclusion initiatives including Dimensions EDI, the Canada Research Chairs Program Public Accountability, EDI in Teaching and Research Awards, and the EDI Data Hub and Data Dashboard that enable disaggregated data on the research ecosystem. The Global Engagement Plan, the Campus Mental Health Strategy, and the Sustainability Strategy also all contribute to institutional excellence.

Support for our Researchers and our Partners in Research

The University of Calgary is committed to supporting its researchers and research communities in meeting RDM requirements and in incorporating RDM best practices into their work. This will allow the institution to increase research capacity and drive innovation, as outlined in the Research Plan.

The University further acknowledges that it has a role to play in supporting the RDM rights and interests of all parties involved in research, including research participants, communities, and partner organizations. It recognizes the importance of data – including quantitative, qualitative and stories – for understanding access to, and success within, the research ecosystem for vulnerable and historically marginalized populations, and members of equity deserving groups, including women, racialized persons, persons with disabilities, LGBTQ2S+ persons, and Indigenous peoples, communities, collectives, and/or organizations.

Collaboration

The University of Calgary recognizes that collaboration across research- and RDM-supporting units and portfolios, and with external stakeholders and community partners, is crucial to ensuring the institution fosters an environment conducive to best practices in research data management, and to providing the support researchers need to meet RDM requirements. Collaboration with other institutions and national organizations is also essential to support RDM in the broader research environment. The University further acknowledges that RDM best practices can support efforts to move towards interdisciplinary and transdisciplinary research, as outlined in *Eyes High, Growth Through Focus,* and the new strategic directions 2030 process.

Context-Based Approach

The University of Calgary acknowledges that there can be no "one-size-fits-all" approach to RDM, given the diversity of researchers, range of research questions, ways of knowing, participants, data types, methods of data collection and analysis, disciplinary practices, ethical obligations, legal and regulatory frameworks, and partnership environments with which and within which our researchers work. The University will support its researchers in implementing RDM best practices appropriate to their research context, and will ensure that our RDM support is at a consistently high standard regardless of the research context.

The Importance of Research Data and Research Data Management

Research data, as defined by the Tri-Agencies, "are data that are 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"[2]. Research data result from the work conducted on research materials,

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be they books, ecosystems, subatomic particles, genes, individual humans, or entire communities[3]; they can even be derived from other research data. At a fundamental level, the University of Calgary recognizes that data, in all their varied forms, are at the heart of the research enterprise.

In its 2016 Statement of Principles on Digital Data Management, the Tri-Agencies stated that "The ability to store, access, reuse and build upon digital research data has become critical to the advancement of science and scholarship, supports innovative solutions to economic and social challenges, and holds tremendous potential for Canada's productivity, competitiveness and quality of life"[4]. Regardless of the types and quantities of research data our researchers work with, or their potential significance beyond a particular project, the University of Calgary believes that there are real and tangible benefits of RDM at the level of the individual research project, including increasing the rigour, transparency, and efficiency of research, as well as reducing costs. Employing best practices in RDM will also allow researchers to share their research data more effectively, where such sharing is permitted and appropriate, to allow future research and the incremental growth of knowledge. In short, good RDM practices make research better and accelerate the expansion of knowledge.

The University of Calgary acknowledges that there are many factors that must be considered in implementing best practices in RDM: these include different types and scales of data; different data collection and analysis methodologies; evolving research practices; technological changes; costs; human and infrastructure resource needs; and ethical and legal considerations, such as privacy and research security. We will work to support our research communities in navigating these factors, and to create an institutional framework which provides comprehensive support for RDM.

Indigenous Data Sovereignty

In *ii' taa'poh'to'p*, the University of Calgary's Indigenous Strategy, the University made seven commitments to truth, reconciliation, and transformation regarding its relationship to Indigenous peoples. This Research Data Management Strategy upholds these commitments and works to further their implementation. The University recognizes that the commitments made in this Strategy are only the beginning of the discussions around Indigenous data sovereignty at the institution, and commits to the work of co-developing with our partners a framework to support Indigenous data sovereignty.

In this Strategy, the University of Calgary commits to respecting, supporting, and enabling Indigenous peoples' inherent sovereignty over the research data generated by and with First Nations, Métis, and Inuit peoples and communities within the land currently known as Canada, including the rights to own, control, collect, access, possess, protect, use, and share these data.

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[3] "1c: How are research materials related to research data?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy*, last accessed July 13, 2022 at https://science.gc.ca/eic/site/063.nsf/eng/h_97609.html#1c

[4] "Preamble", *Tri-Agency Statement of Principles on Digital Data Management*, last accessed July 13, 2022 at https://www.science.gc.ca/eic/site/063.nsf/eng/h_83F7624E.html

The institution will work with its Indigenous partners in research to ensure that Indigenous ways of knowing, doing, connecting and being are respected in all aspects of research data management. The University will work with its research community to ensure that all researchers working with Indigenous individuals, communities, collectives, and/or organizations treat the data generated by this work in a good way. The institution acknowledges that this will mean parallel paths are necessary for the management of research data relating to Indigenous peoples and communities. The University also acknowledges that it must help build capacity for RDM for Indigenous researchers, communities, collectives, and organizations.

Specific areas of institutional support for RDM pertaining to Indigenous data sovereignty are described in the following sections.

Equity, Diversity and Inclusion

Through the establishment of the Office of Equity, Diversity and Inclusion and the position of Vice Provost and Associate Vice President Research (Equity, Diversity and Inclusion), the University of Calgary has committed to "advancing EDI in research, including the production of knowledge, equitable access to funding opportunities, and the equitable and inclusive participation of all individuals in the research ecosystem".[5] This Strategy upholds this commitment and works to further its implementation. The University recognizes that the commitments made in this Strategy are only the beginning of the discussions around data pertaining to equity, diversity and inclusion, and commits to the work of developing policies, processes, and training that support the research community in appropriately collecting, handling, and storing these data.

In this Strategy, and the principles of "nothing about us, without us" and "one-size-does-not-fit-all" articulated in our Dimensions EDI strategic vision, the University commits to supporting the rights and interests of members of equity-deserving groups involved in research, including both the researchers themselves and the participants in research. The institution commits to working with its research community to ensure that all researchers working with equity, diversity and inclusion data treat the data generated by this work in an appropriate way.

The University also acknowledges that a framework must be put in place to ensure that EDI data collected by the institution about university community members and subsequently used in research are appropriately managed.

Specific areas of institutional support for RDM pertaining to EDI data are described in the following sections.

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[5] Office of Equity, Diversity and Inclusion, "EDI in Research Ecosystem", last accessed December 14, 2022 at https://www.ucalgary.ca/equity-diversity-inclusion/edi-research-and-teaching.

Scope

This Strategy is relevant to all University of Calgary researchers, as defined in the University's Research Integrity Policy.

This Strategy applies to all digital research data (born-digital or digitized) generated and/or used by researchers at the University of Calgary. It does not apply to physical materials.

The support services described in this Strategy will be provided to all research activities, regardless of whether they are led by faculty, postdoctoral fellows, graduate, or undergraduate students; and whether they are funded by the Tri-Agency or other funders, or unfunded. RDM support services will be provided to all those involved in research at the University of Calgary, including faculty, postdoctoral fellows, staff, and students.

Oversight and Review

This Strategy comes under the purview of the Vice President (Research). A steering committee, comprising key institutional stakeholders in RDM, is responsible for implementation and post-implementation review of the Strategy. These stakeholders include representatives of the Vice President (Research) Office, including the Research Services Office; the Research Ethics Boards; Libraries and Cultural Resources; Information Technologies, including Research Computing Services; the Office of Indigenous Engagement; the Office of Equity, Diversity and Inclusion; researchers from the three major areas of research funding (Health Sciences, Natural Sciences and Engineering, and Social Sciences and Humanities); Graduate Studies; the Graduate Students Association; the Postdoctoral Association; and legal counsel for research. The steering committee will consult with external stakeholders and community partners as needed.

The Strategy will be implemented on a five-year timeline. As this is the initial RDM Strategy, there will be a review after the first year of implementation to ensure that any major issues which may have arisen in the first year are addressed appropriately. The Strategy will also be reviewed in the fourth year; it will be revised as appropriate at that time, to ensure it continues to meet the needs of the University of Calgary and its diverse research community.

Institutional Support for Research Data Management

Institutional Policies and Processes

The University of Calgary currently has several institutional policies, systems, schedules, and processes which address different aspects of RDM to varying degrees (see Appendix A for a full list). Creating and maintaining a robust policy, procedure, and process framework for RDM will be essential to allowing the institution to support its research communities and meet its institutional obligations.

In the first five-year term of this strategy, the University of Calgary will

- Review its existing policies, procedures, standards, systems and schedules (see the full list in Appendix A) to determine if revisions are needed to adequately address RDM concerns;

- Implement any necessary revisions identified during the review process, such as creating new policies, making amendments to existing documents, and/or establishing common definitions;

- Educate researchers, staff, and other stakeholders as to which elements of the policy framework apply to research data, and which ones do not;

- Educate researchers on their RDM responsibilities within the policy framework;

- Ensure that all RDM-related policies, practices and procedures address the diversity of research conducted at the University;

- Ensure that all RDM-related policies, practices and procedures are supportive and respectful of Indigenous ways of knowing, doing, connecting and being, including respecting and supporting Indigenous data sovereignty, governance, and management;

- Ensure that all RDM-related policies, practices, and procedures are supportive and respectful of principles of equity, diversity, inclusion and accessibility;

- Ensure that all RDM-related policies, practices, and procedures align with and provide support for research security as mandated by the federal and provincial governments;

- Develop and implement a robust Libraries and Cultural Resources policy for Collection Development which encompasses the collection and preservation of research data;

- Work through the Office of Institutional Analysis, Office of Equity, Diversity and Inclusion, Human Resources, University Legal Services, and the Research Ethics Board (REB) to clarify requirements around privacy, confidentiality, and anonymity related to data about the university community in research, particularly demographic data and other EDI-related data;

- Ensure that a proactive and reactive communications strategy is developed around RDM requirements and services; and

- Ensure that the development of the RDM-related policy framework keeps up with the implementation of RDM policies and requirements by funders, publishers, and legislative bodies.

IT Infrastructure

Information technology infrastructure which supports RDM is currently primarily provided by two units on campus: Research Computing Services (RCS) and Libraries and Cultural Resources (LCR). We are working from a solid base that provides many services for our research community, including active storage, secure data storage, a range of High-Performance Computing (HPC) services, and an institutional data repository. As both technology and the needs of our researchers evolve, we must continue to provide both internal resources and access to external resources to accommodate this evolution.

In the first five-year term of this strategy, the University of Calgary will

- Continue institutional support for, and maintain strong policy in, areas such as cybersecurity and identity and access management;

- Undertake hardware refreshes and/or replacements in a timely fashion;

- Ensure necessary software licenses and service subscriptions are acquired and/or maintained;

- Pursue CoreTrustSeal certification for our institutional data repository;

- Ensure researchers have access to long-term data preservation and secure storage for sensitive data;

- Explore options for ensuring researchers using RCS infrastructure are engaging in best practices in RDM and cybersecurity before they begin using the infrastructure (e.g., through the submission of data management plans);

- Ensure that RDM-related IT infrastructure is appropriately resourced, in terms of both funding and personnel; and

- Ensure that the development and maintenance of our RDM-related IT infrastructure keep up with the implementation of RDM policies and requirements by funders, publishers, and legislative bodies.

Where appropriate, we will work with partners such as the Digital Research Alliance of Canada and the Borealis Dataverse Repository service to maximize the availability of digital research infrastructure to which our research communities have access.

RDM and Cybersecurity

In the context of RDM, researchers may need to balance data sharing and access with data security provisions. To ensure that the integrity of their research is not compromised, that sensitive data are always secure and protected, and that 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 cybersecurity practices and infrastructure. These practices should be agreed to by all research team members and partners. RCS and the IT Cybersecurity team have developed several research data security guidelines, and provide cybersecurity support to protect the confidentiality, integrity and availability of data services against cybersecurity attacks and data breaches. Information about IT and RCS's cybersecurity guidelines and support services can be accessed via https://it.ucalgary.ca/it-security.

Support Services

Support services for RDM are currently primarily provided by three units: Libraries and Cultural Resources, IT/Research Computing Services, and the Research Services Office. These services include basic training and consultation for key areas of RDM, such as data management plans; basic training and consultation for data management within the High-Performance Computing setting, including for cybersecurity; and basic guidance on meeting funders' RDM requirements.

The University of Calgary has a core of knowledgeable and experienced staff who can guide the development of RDM support services as they scale to meet researchers' needs.

In the first five-year term of this strategy, the University of Calgary will

- Ensure adequate opportunities for RDM-related training and capacity-building for faculty, postdoctoral fellows, staff, and students;

- Ensure that researchers who work with sensitive data (e.g., human participant data including demographic and health information; Indigenous data; equity, diversity and inclusion data; data involving vulnerable populations, data restricted by legal agreement) are both adequately trained and have adequate support to ensure the appropriate protection of those data;

- Ensure an adequate number of librarians and staff in Libraries and Cultural Resources who can provide timely, accurate and detailed RDM-related services, support, and training, particularly in the areas of data curation and preservation;

- Ensure an adequate number of staff in IT/Research Computing Services who can provide timely, accurate and detailed RDM-related services, support and training;

- Ensure the Research Services Office and Research Ethics Boards have the competence and capacity to provide timely, accurate and detailed RDM-related support for grant applications,

ethics applications, and contracts and agreements, by providing RSO staff with appropriate resources and training opportunities;

- Ensure the Indigenous Research Support Team has the competence and capacity to provide timely, accurate and detailed RDM-related support specific to Indigenous data sovereignty, by providing IRST members with appropriate resources and training opportunities, and by ensuring that this team is staffed and funded appropriately on an ongoing basis;

- Ensure that research-supporting positions in the faculties – e.g., research facilitators, privacy specialists, and others – have the competence and capacity to provide RDM-related support to researchers, by providing appropriate resources and training opportunities;

- Ensure that researchers can easily locate and access usable, up-to-date RDM-related resources and services through the development of an RDM-focused virtual support 'desk';

- Ensure that researchers have resources and opportunities that allow them to increase their knowledge and skills in the area of Indigenous data sovereignty (e.g., supporting training programs for frameworks such as OCAP®);

- Support researchers in working appropriately with Indigenous partners and communities in terms of Indigenous data sovereignty and research data management;

- Ensure that researches have resources and opportunities that allow them to increase their knowledge and skills in the area of conducting research related to equity, diversity and inclusion;

- Establish a proactive and reactive communications plan to keep researchers informed of changes and opportunities in the RDM landscape;

- Ensure that RDM-related support services are appropriately resourced, in terms of both funding and personnel; and

- Ensure that the development and maintenance of the University's RDM-related support services keep up with the implementation of RDM policies and requirements by funders, publishers, and legislative bodies.

Collaboration across the RDM-supporting units—including but not limited to Research Computing Services, Libraries and Cultural Resources, and the Research Services Office—is essential in ensuring the success of the University's RDM efforts; ways to support this collaboration should be explored, such as the development of a system or platform to link RDM-related services, requirements, and compliance across administrative units.

Building a Broader Research Data Management Culture

Research data management will impact the University of Calgary research community's regional, national, and international colleagues and partners. For this reason, the institution will participate in efforts to build a broader culture of RDM, both within and beyond the university.

In the first five-year term of this strategy, the University of Calgary will

- Develop a network of faculty, postdoctoral fellows, students and staff who will act as 'Research Data Champions' to promote and demonstrate the importance of research data and RDM to their colleagues;

- Work with local, regional and national partner institutions, both directly and through organizations such as Universities Canada, U15, and the Canadian Association of Research Libraries, to advocate for common approaches to and increased support for RDM-related needs, such as financial support for researchers and institutions for RDM-related costs, frameworks for supporting and implementing Indigenous data sovereignty at research institutions and in Indigenous communities, *inter alia*;

- Work with Indigenous communities and stakeholders to provide access to research data generated by, with or about Indigenous individuals or communities that are held at the University of Calgary;

- Work with Indigenous stakeholders and communities to build capacity for data governance and management within communities;

- Work with external partners and stakeholders from government, industry, and community organizations to clarify expectations of and responsibilities for RDM, including data sharing and re-use where permitted and appropriate; and

- Encourage our tenure and promotion committees to explore how to incorporate data-related work into their review of research excellence and impact, in line with the University's commitment to the San Francisco Declaration on Research Assessment.

Looking Ahead

This Strategy is a living document: it will necessarily evolve as research data management requirements, practices, and understanding evolve. Moving forward, the University of Calgary will ensure that its institutional structures support our research communities as they respond and adapt to this evolution, and that best practices in RDM are part of the fundamental fabric of research as we continue our journey of research excellence.

Definitions

Definitions are presented in alphabetical order.

Data Management Plan

A formal, 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 throughout the lifecycle of a research project, including after the active phases of the project have been completed.

(Adapted from "4e: What is a data management plan?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy*, last accessed November 29, 2022 at 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#4e; and Digital Research Alliance of Canada, "DMP Tutorial Video Series: Introduction to Data Management Plans (DMPs)", last accessed November 30, 2022 at https://www.youtube.com/watch?v=L9AbOoHk-PA)

Indigenous Data Sovereignty

The inherent and inalienable right of Indigenous communities, nations and governments to govern the data created by, about, or with them, including Traditional Knowledge. It is a key element of Indigenous self-determination and self-government. Frameworks supporting Indigenous data sovereignty include the OCAP® Principles (Ownership, Control, Access and Possession) stewarded by the First Nations Information Governance Centre, and the CARE Principles (Collective Benefit, Authority to Control, Responsibility and Ethics) set out by the Global Indigenous Data Alliance.

(Informed by First Nations Information Governance Centre (August 2022). *Exploration of the impact of Canada's information management regime on First Nations data sovereignty.* https://fnigc.ca/wp-content/uploads/2022/09/FNIGC_Discussion_Paper_IM_Regime_Data_Sovereignty_EN.pdf; Kukutai, Tahu, and John Taylor (eds.) (2016). *Indigenous Data Sovereignty Toward an Agenda.* Canberra: ANU Press. https://press.anu.edu.au/publications/series/caepr/indigenous-data-sovereignty)

Metadata

Information that describes and documents data; it is often called 'data about data'. Most data repositories will require at least a basic set of metadata to be included with any data deposit, such as who created the data; when they were created; and information necessary to understand and reuse the data.

(Informed by UCalgary Libraries and Cultural Resources' Research Data Management LibGuide: https://libguides.ucalgary.ca/c.php?g=395022&p=5068942, and by "4l: What are metadata?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy*, last accessed November 29, 2022 at 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#4l)

Research Data

Data that are used 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 a given research community as necessary to validate research findings and results.

(See "1b: What are research data?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy,* last accessed July 13, 2022 at 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#1b)

Research Data Management

The range of processes and procedures "applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data".

(See "1d: What is research data management?", *Frequently Asked Questions: Tri-Agency Research Data Management Policy*, last accessed July 13, 2022 at 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#1d)

Research Data Repository

An online database service which acts as an archive for research data. These services manage the long-term storage and preservation of research data, and make them available for discovery and appropriate access through an online catalogue.

(Adapted from Portage Network, "Research Data Repositories 101, Module 2: What are Research Data Repositories?", last accessed November 29, 2022 at https://learn.scholarsportal.info/modules/portage/research-data-repositories-101-module-2/)

Sensitive Data

Data that must be safeguarded against unwarranted access or disclosure. From a legal/administrative perspective, such as that set out in UCalgary's Information Security Classification Standard (see the definitions of level 3 and level 4 information), this can include:

- Personal information, including demographic data and other equity, diversity and inclusion data

- Personal health information

- Research data about humans (i.e., data that are subject to TCP2)

- Educational records

- Customer records

- Financial information

- Criminal information

- Confidential personnel information

- Information that is deemed to be confidential

- Information entrusted to a person, organization or entity with the intent that it be kept private and access be controlled or restricted

- Information that is protected by institutional policy from unauthorized access

Sensitive data may also include Indigenous data and/or Traditional Knowledge, data about vulnerable populations, and certain types of geographic information (e.g., detailed locations of endangered ecosystems or species).

(Adapted from Sensitive Data Expert Group. (2020). Sensitive Data Toolkit for Researchers Part 1: Glossary of Terms for Sensitive Data used for Research Purposes. Zenodo. https://doi.org/10.5281/zenodo.4088946 ; and from presentations by Victoria Smith, Privacy, Policy and Sensitive Data Coordinator, Digital Research Alliance of Canada)

Appendix A: Current UCalgary policies, standards, and schedules with a relation to RDM

The following University of Calgary policies, standards, and schedules have some relation to research data management:

- Acceptable Use of Electronic Resources and Information Policy
- Information Asset Management Policy
- Intellectual Property Policy
- Information Security Classification Standard
- Master Records Retention Schedule (MaRRS): Research Involving Human Subjects
- Master Records Retention Schedule (MaRRS): Research Not Involving Human Subjects
- Research Integrity Policy
- Storage of Inactive Clinical Research Records Policy

There are other policies and systems which might be expected to relate to RDM in some way, but in fact do not as they stand currently: the Privacy Policy and the University Classification System (UCLASS). Research data is excluded from the Freedom of Information and Protection of Privacy Act (FOIPP; see section 4(1)(i)) of the act), and thus does not fall under the Privacy Policy. UCLASS applies only to Business Information Assets, as indicated in section 4.9 of the Information Asset Management Policy; Scholarly Information Assets are instead identified and classified "in accordance with discipline-specific taxonomies and the Information Security Classification Standard".

Appendix B: Development of the UCalgary RDM Strategy

In early 2022, the Vice President (Research) convened a Steering Committee and a Working Committee, each co-chaired by representatives from the Vice President (Research) Office and Libraries and Cultural Resources (LCR). Strategy development began by assessing the current state of RDM infrastructure and support at UCalgary, including relevant policies and procedures, practices, supports, services, and resources. This assessment used the Maturity Assessment Model in Canada, developed by the Network of Experts associated with the Digital Research Alliance of Canada. The assessment found the following:

- Institutional Policies and Processes related to RDM at UCalgary are generally not mature.
- IT Infrastructure for RDM at UCalgary is generally at a high level of maturity, with some notable exceptions (Preservation/Archival Storage, Sensitive Data Deposit).
- Support Services for RDM are focused in LCR and IT. Half of these services are mature (robustly operationalized), while the other half are not formalized, under development, or ad hoc.
- Financial Support for RDM, both for infrastructure and for human resources in the key service-providing units (LCR, IT, and the Research Services Office [RSO]) is currently very limited.

The Steering and Working Committees then undertook a future state envisioning exercise, with the intention of articulating a desired near- to medium-term state of RDM at UCalgary in which the institution

1. meets the institution-facing requirements of the Tri-Agency RDM Policy,
2. enables its researchers to meet the researcher-facing requirements of the Policy (i.e., the data management plan and data deposit requirements), and
3. enables its researchers to meet the RDM requirements which may be put in place by other organizations.

In the summer of 2022, the Working Committee drafted the initial version of the UCalgary RDM Strategy, which was shared with the Steering Committee in August 2022. In the fall of 2022, the Working and Steering Committees sought the UCalgary research community's input on the Strategy through several awareness raising, capacity building, and feedback gathering opportunities. These included:

- Formal presentations to the Indigenous Scholars' Circle, Research and Scholarship Committee, General Faculties Council, Associate Deans Research Council, and the Office of Equity, Diversity and Inclusion.
- Four informal "watercooler" discussions around RDM, the Tri-Agency Policy, and the strategy development process. Two of these watercoolers were general, one focused on research computing services, and one focused on qualitative research.
- The first five webinars in the "Illuminating Research Data Management" capacity-building series, which was funded by a SSHRC Connections Grant for RDM Capacity Building awarded to Dr. Penny Pexman.
- A survey on the draft Strategy which was open to all members of the UCalgary research community, and which asked for feedback regarding each section of the Strategy. The survey ran from October 17-November 20, 2022, and was promoted through multiple channels, including listservs, university-internal communication channels, and the webinars and presentations mentioned above.

The feedback was incorporated into the draft Strategy, and was reviewed by the Working and Steering Committees prior to submission of the Strategy to the Vice President (Research) for approval.