UNIVERSITY OF ALBERTA

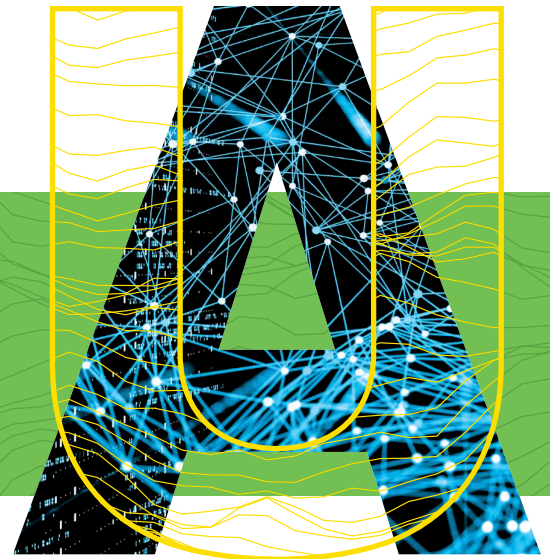## Version 1.0

INSTITUTIONAL RESEARCH DATA MANAGEMENT STRATEGY

SPONSORS:

Vice-President (Research & Innovation)
University of Alberta Library

Contents

Purpose

In March 2021 the *Tri-Agency Research Data Management Policy*[1] was released, highlighting the importance of research data management (RDM), including data management planning, metadata and documentation, collection and storage of data, Indigenous data sovereignty, and long-term data stewardship.

The Tri-Agency policy emphasizes the shared responsibilities of researchers, research communities, research institutions, and research funders and requires that all institutions wishing to administer Tri-Agency funds to develop and release a publicly facing institutional RDM strategy.

The overarching purpose of the University of Alberta's *Institutional Research Data Management (RDM) Strategy* is twofold:

1. To develop and nurture a culture that recognizes RDM as being an essential component of the research processes and academic lifecycles;

2. To identify, develop, and evolve cross-institution supports and services that can be leveraged by researchers in implementing responsible and effective RDM practices into their research activities.

U of A's Institutional RDM Strategy is informed by a number of widely recognized key guiding principles, including the FAIR Principles[2] which highlight the importance of making research data findable, accessible, interoperable, and reusable. Principles supporting Indigenous communities and data sovereignty include both the CARE Principles for Indigenous Data Governance[3] which highlight considerations regarding collective benefit, authority to control, responsibility, and ethics, as well as the First Nation Information Governance Centre developed OCAP®[4] Principles[5] which recognize and establish the importance of ownership, control, access, and possession with respect to First Nations information and data.

This document will be used by stakeholders across the institution in helping to guide the development and delivery of RDM supports, services, and policies. The roadmap content will be reviewed and assessed by the Institutional RDM Strategy Working Group, or an evolved version of it, both annually and on an as needed basis.

Indicators of success for specific activities will be identified and developed, including such things as research community of practice satisfaction, delivery and uptake of RDM learning and training opportunities, usage statistics, milestones related to the development of a central online RDM Hub, and continued involvement in, and outcomes of, national RDM activities and initiatives.

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[1] Government of Canada (2021). Tri-Agency Research Data Management Policy. Retrieved from https://science.gc.ca/site/science/en/interagency-research-funding/policies-and-guidelines/research-data-management/tri-agency-research-data-management-policy

[2] Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018 (2016). https://doi.org/10.1038/sdata.2016.18

[3] Global Indigenous Data Alliance (2019). CARE Principles for Indigenous Data Governance. Retrieved from https://www.gida-global.org/care

[4] OCAP® is a registered trademark of the First Nations Information Governance Centre (FNIGC)

[5] First Nations Information governance Centre (2022). The First Nations Principles of OCAP. https://fnigc.ca/ocap-training/

RDM Advisory and Institutional RDM Strategy Working Groups

In the Fall of 2018 a community of practice focused *RDM Advisory Group* was established, consisting of representatives from key areas across the university, notably including the Office of the Vice-President (Research & Innovation) (VPRI), University of Alberta Library (UAL), Information Services & Technology (IST), research ethics and administrative services groups, Faculty of Native Studies, Faculty of Graduate Studies & Research (FGSR), Postdoctoral Fellow Association (PDA) and Graduate Students' Association (GSA). The *RDM Advisory Group* developed a set of guiding principles - *Statement of Strategic Principles for Research Data Management at the University of Alberta* - which have helped to guide the development of U of A's institutional RDM strategy including with respect to components related to shared responsibility and inclusivity, Indigenous data sovereignty, research data security, ethical, legal and privacy requirements, and education and capacity building.

In Fall 2019 a core *Institutional RDM Strategy Working Grou*p was established, consisting of representatives from the VPRI office and including research ethics and administrative services, UAL, and IST. Co-sponsored by the VPRI office and UAL, the *Institutional RDM Strategy Working Group* has focused upon the incremental drafting of U of A's institutional RDM strategy and associated activities while allowing for the critical and strategic evolution of the Canadian RDM landscape to occur.

Institutional RDM Strategy and Roadmap

Please see the appendix for a list of acronyms used in this strategy.

1. Raise Awareness

Identifying and engaging with a robust community of practice of stakeholders is essential in developing and delivering effective RDM resources, supports, and services that meet the needs of the community and support research excellence. Local RDM champions across all disciplines, including researchers and staff, have key roles to play in supporting and promoting RDM activities across the university. RDM is a shared responsibility and, as such, a range of areas, offices, and stakeholders across the university must be involved to ensure its effective delivery and continued growth. The University of Alberta Library (UAL) is notably involved in local, regional, and national RDM initiatives and provides essential support and services, including with respect to such things as training and education, data management planning, metadata and documentation, and the long-term stewardship of research data including their deposit, curation, and preservation.

Raise Awareness

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
1.1 Identify RDM stakeholder communities, offices, and areas across the university	An RDM Advisory Group was formed in Fall 2018, consisting of individuals situated across key areas including VPRI, UAL, IST, FGSR, research ethics and administrative services groups, Faculty of Native Studies, PDFA, and GSA. The *RDM Advisory Group* developed a set of guiding principles which have helped to inform the development of U of A's institutional RDM strategy.

In Fall 2019 a core *Institutional RDM Strategy Working Group* was formed. The working group, co-sponsored by VPRI and Library, and consisting of a subset of the RDM Advisory Group including representatives from research ethics and administrative services and IST, was formed. This working group has focused upon the drafting of U of A's institutional RDM strategy and associated activities. | Identifying a robust community of practice inclusive of stakeholders situated across all disciplines and areas, is a priority. Based on interest, this community of practice will have the opportunity to inform and support strategic RDM initiatives across the university.

Resources required include personnel with dedicated time and capacity to support the development and delivery of outreach and communications activities. | Ongoing work, with more detailed activities and timelines to be established after the release of the initial version of the Institutional RDM Strategy. | To be led by the *Institutional RDM Strategy Working group*, or an evolved version of it that may include additional stakeholders from across the university. |
| **1.2 Identify and Recruit institutional 'champions' that will help to promote the importance and value of RDM and engage with various stakeholder communities** | Both the Institutional RDM Advisory and Strategy Groups are composed of RDM ''champions' situated across key areas such as the VPRI office and including research ethics and administrative services, UAL, IST, FGSR, Faculty of Native Studies, PDFA, and GSA. | Identifying and recruiting institutional RDM champions is a high priority. RDM champions may notably include representative researchers from across all disciplines, College and Faculty Deans, Associate Deans Research (ADRs), Research Administrators, research staff, Indigenous researchers and stakeholders, and graduate students.

Approaches for identifying and recruiting RDM champions will be determined and may include collaborations with key areas such as U of A's President Executive Committees (PEC), General Faculties Council (GFC), Dean's Council, University Research Policy Committee (URPC), Signature Areas of Research, and the office of the Vice-P`rovost, Indigenous Programming & Research.

Resources required include personnel with dedicated time and capacity to support the development and implementation of recruitment materials and resources, as well as communication and outreach activities. | Ongoing work, with more detailed activities and timelines to be established after the release of the initial version of the Institutional RDM Strategy | To be led by the *Institutional RDM Strategy Working group*, or an evolved version of it that may include additional stakeholders from across the university. |

Raise Awareness *con't*

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
1.3 Develop, source, and coalesce RDM related awareness materials and resources for different communities	Many local awareness materials and resources have been developed by and across a range of areas including UAL, REO, IST, FGSR, etc. U of A additionally leverages resources developed by external organizations, including the Digital Research Alliance of Canada (DRAC). UAL's RDM Strategies Director co-chairs the DRAC DMP Expert Group and is also a member of the RDM Training Expert Group. The Chair of the Dataverse North Expert Group is additionally situated within UAL. Collectively, these groups have developed and released a wide range of both generic and discipline specific resources and across a range of RDM areas, notably including those related to DMPs and data deposit.	Both the RDM community of practice and identified champions *(see 1.1 & 1.2)* will play key roles in identifying gaps in materials and resources, including with respect to their development and sourcing. Additional resources required are to be determined.	Ongoing work - more detailed activities and timelines will be established as activities outlined within sections 1.1 & 1.2 evolve.	To be led by the *Institutional RDM Strategy Working group*, or an evolved version of it that may include additional stakeholders from across the university.

Raise Awareness *con't*

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
1.4 Determine and apply appropriate RDM information and resources delivery mechanisms	The UAL website includes an RDM webpage that provides information, resources, and links to key support platforms; The IST website includes information and resources with respect to data storage and security; UAL has developed and delivered RDM events and activities, as well as consultations, for a number of years and IST regularly delivers Research Computing Bootcamps that include RDM related content; FGSR has developed required courses both for graduate students *(Ethics & Academic Citizenship)* and their supervisors *(Graduate Supervision Development Program)* which include RDM components developed and delivered by the UAL's RDM Strategies Director; The research ethics review process promotes awareness related to RDM best practices available resources and supports	Determining appropriate outreach delivery mechanisms will involve soliciting feedback from stakeholders across the university, including the community of practice and RDM champions *(see 1.1 & 1.2)* **Central online RDM Hub:** Incremental development of a central online hub for supporting the discovery and use of RDM information and resources and access to institutional expertise, has been identified as a priority activity. The RDM Hub's framework and content will be informed in part by needs identified by the community of practice *(see 1.1)*. Content with respect to Indigenous data sovereignty will need to be informed and developed through collaboration with Indigenous research related stakeholders and areas (e.g., Faculty of Native Studies; Vice Provost (Indigenous Programming & Research); SKIPP[6]), and in alignment with U of A's *Indigenous Strategic Plan[7]*. Resources required include personnel with dedicated time and capacity to support the soliciting and review of feedback from the community of practice and RDM champions Personnel and expertise to assist with the development and implementation of the RDM hub, as well as its promotion and ongoing maintenance	Solicitation of feedback will be ongoing, commencing once a community of practice and RDM champions have been identified **Central online RDM Hub:** Short-term for initial version, through 2024 Medium term for expanded and more comprehensive version - through 2025 Long term ongoing promotion and maintenance	*Institutional RDM Working Group*, or an evolved version of it that may include additional stakeholders from across the university **Central online RDM Hub:** Co-sponsored by Library & VPRI

Raise Awareness *con't*

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
1.5 Participate in Tri-Agency RDM consultations	Members of the Institutional RDM Strategy Working Group have participated in all Tri-Agency RDM consultation opportunities available, including providing feedback on the Tri-Agency draft RDM policy in 2018 As co-chair of the DRAC DMP Expert Group, the Library's RDM Strategies Director is involved in consultations with the Tri-Agency and supporting activities relating to DMP requirements, including with respect to their review and assessment	Participation in future Tri-Agency RDM consultations will be a continued priority, and these should ideally include involvement from the larger community of practice *(see 1.1)*	Ongoing and as opportunities are presented	Local RDM community of practice; *Institutional RDM Working Group* or an evolved version of it
1.6 Participate in regional and national RDM consultations and events	Library situated members of the RDM Working Group have worked with the DRAC National Training Expert Group to plan and deliver institutional RDM Strategy webinars and workshops In response to a national call for position papers the offices of VPRI, IST, & UAL co-authored a paper[8] with feedback and recommendations relating to Canadian digital research infrastructure needs; UAL's RDM Strategies Director co-authored a position paper[9] on data management planning in Canada and participates regularly in DRAC Network of Experts and community of practice consultations	Participation in future regional and national RDM consultation and events will be a continued priority, and should ideally include involvement from the larger community of practice (see 1.1)	Ongoing and as opportunities are presented	Local RDM community of practice; *Institutional RDM Working Group* or an evolved version of it

[6] https://www.ualberta.ca/situated-knowledges-indigenous-peoples-place/index.html

[7] https://www.ualberta.ca/indigenous/strategic-plan/index.html

[8] https://alliancecan.ca/sites/default/files/2022-03/katharine.mooreualberta.ca_-ndrio-feedback-from-uofa-09de20.pdf

[9] https://alliancecan.ca/sites/default/files/2022-03/ndrio_whitepaper_dec2020_datamanagementplanning.pdf

2. Institutional Readiness: Assess the current and ideal states for RDM across specific categories

A key component of U of A's institutional RDM Strategy involves the assessment of the current state of RDM across the university, as well as identifying ideal states across key areas based on researcher and stakeholder needs. As RDM support and services become available and evolve, researchers need to be aware of and be able to readily access and use them. Existing RDM services that will be assessed include those relating to data management planning, data repositories, and training, as well as institutional policies, guidance, and procedures.

Assess Institutional Readiness

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
2.1 Assess institutional data and RDM assets and data management practices at the university	There is significant institutional expertise and support situated across key central areas such as UAL, REO, and IST, as well as at the College and Faculty levels. The Library has a dedicated RDM Strategies Director, with the intent of appropriately expanding this portfolio as needed and able. Some notable institutional data and RDM assets include: • DMP Assistant • U of A Borealis Dataverse • ERA • Aviary • University of Alberta Research Data Centre • UAL Data Services It is recognized that data management practices vary widely across the institution, including as a function of research disciplines and methodologies.	A robust understanding of both the current data management practices as well as needs of researchers across campus is required in order to develop and deliver effective support and services. Focused research on understanding data management practices and needs will be conducted, including through: 1. Development and delivery of a University-wide survey targeted at researchers and stakeholders across the larger community of practice (see 1.1); 2. Development and delivery of a University-wide environmental scan of research and data management supports and services available Resources required include personnel with dedicated time and capacity to assist with the development, delivery, and analysis of both the survey and environmental scan, as well as dissemination of findings and recommendations.	Short to medium term - by mid 2024	*Institutional RDM Strategy Working group*, or an evolved version of it; Work led by UAL RDM Strategies Director

Assess Institutional Readiness *con't*

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
2.2 Evaluate Existing RDM Services *con't*				
2.2.1 Data Management Plans	UAL hosts Tri-Agency endorsed DRAC DMP Assistant, a nationally funded and freely available web-based bilingual platform for supporting the development of DMPs UAL's RDM Strategies Director co-chairs the DRAC DMP Expert Group and is a member both of the DMP Assistant Service and Development Team and the national Steering Committee which includes Tri-Agency representatives Regular DMP focused outreach, consultations, learning sessions and workshops are delivered.	Dedicated DMP Assistant administrator support including for maintenance and customization of DMP templates and guidance, reporting metrics, collaboration and interoperability with central offices (e.g., REO, RSO), processes and systems. DMPs are increasingly being required as part of research funding applications and are a core component of the Tri-Agency RDM Policy. Increased knowledge and capacity for DMP support across both key central central areas (e.g., Library, REO, RSO) as well as at the College and Faculty level is needed. Resources required include dedicated DMP Assistant administrator and training support personnel.	Ongoing	*Institutional RDM Strategy Working group*, or an evolved version of it; UAL, with work led by RDM Strategies Director; RDM champions across Colleges and Faculties;
2.2.2 Data repositories and archiving	UAL hosts and delivers a range of digital research data repositories available to researchers across campus, including Dataverse, ERA, and Aviary. UAL is a member of Borealis, the Canadian Dataverse Repository community. U of A and its research community has freely available access to the Federated Research Data Repository (FRDR) which is an open research data repository that can support very large data deposits, well into the TBs. Additionally, there are a wide range of external disciplinary specific data repositories available for researchers to access and use. The chair of DRAC's Dataverse North Expert Group is situated within UAL.	Expanded repository service models focused on supporting researcher needs, data security requirements and deposition activities. Expanded human resources with respect to dedicated personnel for supporting repository and data deposit activities including curation, metadata creation, and preservation.	Medium to long-term, 1-3 years, with ongoing assessment	*Institutional RDM Strategy Working group*, or an evolved version of it; Library (Digital repository, data, and RDM services)

Assess Institutional Readiness *con't*

Objectives	Current practices & support	Gaps & resources required	Initial proposed timelines	Responsibility
2.2 Evaluate Existing RDM Services *con't*				
2.2.3 Institutional support and training	UAL is a member of and/or involved with regional, national, and international groups including COPPUL, DRAC, Statistics Canada DLI, CRDCN, CNC-CODATA and ICPSR, all of which are involved with developing and delivering RDM related training and resources. IST Research Computing works with researchers on handling active research data with respect to digital research workflows, data transfers to computational resources, and data sharing/access. VPRI leads efforts around safeguarding research . RDM training occurs regularly through webinars and workshops including IST Research Computing Bootcamps and UAL "Support Your Research" webinars, FGSR's required *Ethics & Academic Citizenship and Graduate Supervision Development* programs, and a range of outreach activities.	Increased dedicated personnel and capacity for RDM support and training is required, and this need is expected to increase as the RDM landscape evolves and as a community of practice across the university and researcher needs are identified *(see 1.1 & 1.2)*. Specialized institutional support and training is required with respect to research discipline specific needs, as well as those relating to Indigenous data sovereignty and that is supportive and in alignment with U of A's *Indigenous Institutional Strategic Plan.*	Ongoing	UAL VPRI *Institutional RDM Strategy Working group*, or an evolved version of it; Office of the Vice-Provost, Indigenous Programming & Research RDM champions across Colleges and Faculties
2.2.4 Institutional guidance	The University of Alberta currently has a range of institutional guidance in the form of strategic plans as well as policies and corresponding procedures, and while a number of these relate to RDM, there are none that are specific to RDM. Notable examples include: • University Strategic Plan *(in draft)* • Strategic Research and Innovation Plan *(in draft)* • Indigenous Institutional Strategic Plan • Research Policy and elated procedures regarding research records • Human Research Ethics Policy • Strategic Plan for Equity, Diversity, and Inclusion (EDI) • Research & Scholarship Integrity Policy • Information Technology Security Policy • Information Technology Use & Management Policy	It is recommended that a review of existing institutional policies and procedures occur in efforts to identify opportunities for including guidance with respect to RDM. There may additionally be opportunities for the development of new policies and procedures relating directly to RDM. Specialized human resources are required to review and support work relating to revising and expanding existing university policies, and development of possible recommendations to put forth with respect to RDM-specific policy revisions and development. Strong cross-connections to work relating to the Institutional Strategic Research & Innovation Plan, as well as the Indigenous Institutional Strategic Plan, will be critical.	Long-term - 2-3 years, longer as needed	UAL VPRI *Institutional RDM Strategy Working group*, or an evolved version of it; Additional to be determined

[10] https://www.ualberta.ca/research/research-support/safeguarding-your-research.html

Formalizing RDM Practices

RDM has come to be recognized as an essential component of the research process supporting research excellence, including by research funders as is evident with the release of the *Tri-Agency RDM Policy[1]* in Spring 2021. Key research support activities that involve components of RDM notably include those related to the development and submission of research funding proposals and data management plans, as well as the research ethics process. As highlighted, there is a range of institutional guidance in the form of strategic plans as well as policies and corresponding procedures that relate to RDM, though none are specific to RDM.

Formalizing robust and supportive RDM practices at the University of Alberta may involve the revision of existing policies and/or the development of new policies. RDM-related policies should provide both general and disciplinary specific guidance, as well as for both funded and unfunded research. Strong cross-connections to work relating to the *Institutional Strategic Research & Innovation Plan (SRIP)*, as well the *Indigenous Institutional Strategic Plan (ISP)* are critical in order to ensure that policies are both supportive and in alignment with these foundational strategic plans.

Broad institutional support for RDM related activities will continue to evolve, including those related to data management plans and data deposit, which are key pillars of the *Tri-Agency RDM Policy[1]*. Outcomes of policy review activities may lead to the revision of existing policies and/or procedures, and possibly the development of a dedicated RDM policy.

Institutional RDM Strategy Working Group:

Current Members

- Laura Beard, *Associate Vice-President, Office of the Vice President (Research & Innovation)*
- Scott Delinger, *Director, Research Computing, Information Services & Technology*
- James Doiron, *Research Data Management Strategies Director, U of A Library (Chair)*
- Sharon Murphy, *Associate University Librarian, U of A Library*
- Julie Stephens, *Director, Research Partners, Office of the Vice-President (Research & Innovation)*

Administrative support: Ceri Hughes, Administrative Assistant, Library & Museums

Former Members

- Susan Babcock - *former Director, Research Ethics Office (retired)*
- Alex Clark - *former Associate Vice-President (Research) & Professor, Faculty of Nursing*
- Geoff Harder, *Associate University Librarian, U of A Library (currently on secondment)*

Acknowledgements:

The Institutional RDM Strategy Working Group wishes to acknowledge and thank the following organizations and institutions, for their support and/or contributions with respect to the drafting of the University of Alberta Institutional RDM Strategy:

- The former Portage Network, a national RDM-focused organization launched in 2015 under the Canadian Association of Research Libraries (CARL). Portage has since been rebranded and now exists under the Digital Research Alliance of Canada (DRAC), informally known as Alliance RDM. Portage Network/Alliance RDM and its many Expert Groups developed and delivered a range of resources that contributed to the successful drafting of this strategy document.

- Dalhousie University, for providing a publicly accessible institutional RDM strategy which served as a guiding framework for the development of the U of A Institutional RDM Strategy.

- CIHR, NSERC, and SSHRC for the development and release of the Tri-Agency RDM Policy which served as a catalyst for the development of the U of A Institutional RDM Strategy.

APPENDIX:

ACRONYMS & DEFINITIONS

Acronyms, abbreviations, and terms found within the Institutional RDM Strategy document are listed and defined below.

Acronyms

CARE - A set of principles for Indigenous data governance which highlight considerations regarding collective benefit, authority to control, responsibility, and ethics

CNC-CODATA - Canadian National Committee, Committee on Data, for Science and Technology

COPPUL - Council of Prairie and Pacific University Libraries

CIHR - Canadian Institute for Health Research

CRDCN - Canadian Research Data Centre Network

DLI - Data Liberation Initiative

DMP - Data Management Plan

DOI - Digital Object Identifier

DRAC - Digital Research Alliance of Canada

FAIR - A set of best practice principles supporting making research data findable, accessible, interoperable, and reusable

FGSR - Faculty of Graduate Studies & Research

GSA - Graduate Students' Association

ICPSR - Inter-University Consortium for Political and Social Research

IST - Information Services & Technology

NSERC - Natural Sciences and Engineering Research Council of Canada

OCAP - A set of principles set forth by the First Nations Information Governance Centre[11] which assert that First Nations alone have control over data collection processes in their communities, including with respect to ownership, control, access, and possession

PDFA - Postdoctoral Fellow Association

REO - Research Ethics Office

RSO - Research Services Office

RDM - Research Data Management

SSHRC - Social Sciences and Humanities Research Council

UAL - University of Alberta Library

VPRI - Vice President (Research and Innovation)

[11] https://fnigc.ca/

Definitions

Metadata - The information needed to discover, use, and understand data is referred to as metadata. Metadata describes the who, what, when, where, why, and how of data in the context of research and should provide enough information so that users know what can and cannot be done with the data. Metadata can also facilitate search and retrieval of the data when deposited in a data repository, and is an important step in creating FAIR data[12]

Research Data - Data used as primary sources to support technical or scientific enquiry, artistic activity, scholarship and research, and can be used as evidence in the research process. Research data could include experimental data, monitoring data, observational data, operational data, processed data, public sector data, third party data or repurposed data and can be used within the research community for validation of findings and results. All digital and non-digital content can potentially be considered research data[13]

Research Data Management - Research data management (RDM) refers to the storage, access and preservation of data. The practices of data management encompass the entire data lifecycle from initiation of a project, to conducting the investigation, to backing up and storing the data, to the dissemination of findings and data at the end of the project. Some of the key areas of data management include file naming, data quality control and quality assurance, data access, data documentation, metadata creation and controlled vocabularies, data storage, data sharing, data archiving and preservation, data sharing and reuse, data privacy, data rights and any notebook protocols for lab or field work[14]

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[12] Cornell University Research Data Management Services Group (2022) Retrieved from: https://data.research.cornell.edu/content/writing-metadata

[13] CODATA (2022). Retrieved from: https://codata.org/rdm-terminology/research-data/

[14] CODATA (2022). Retrieved from: https://codata.org/rdm-terminology/research-data-management/

Leading with Purpose.

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