# Research Data Management **Strategy**

Supporting excellence in the co-creation, management and sharing of research data.

2022 – 2025



VANCOUVER ISLAND UNIVERSITY

## Hay ch qu' sii'em siye'yu mukw mustimuxw (Thank you respected ones of this place)

The Vancouver Island University community acknowledges and thanks the Snuneymuxw, Quw'utsun, Tla'Amin, Snaw-naw-as and Qualicum First Nation on whose traditional lands we teach, learn, research, live, and share knowledge.

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#### Purpose of this Strategy

The purpose of this Research Data Management (RDM) Strategy is to ensure that research data is preserved, kept secure and made accessible as appropriate, valuing and further enriching the work done by VIU researchers. As well, creation of a strategy fulfils the first requirement of the Tri- Agency Research Data Management Policy<sup>1</sup> and articulates VIU's commitment to RDM and to data management best practices at the institutional level. This Strategy is based on research, benchmarks and data collected over four stages with various inputs. It outlines the approach used to build a foundation for excellence in RDM from 2022 to 2025 after which time we will evaluate and assess the impact of our efforts and embed continuous improvements in the next iteration of the Strategy.



## Rationale for a Research Data Management Strategy

#### The Tri-Agency policy on Research Data

<u>Management</u> was released in 2021. This policy signaled to Canadian universities, including VIU the need to incorporate supports for data management policies in three ways :

- To create an institutional RDM Strategy in order to be compliant with the Tri-Agencies and receive future research funding. Universities must notify the agencies when the Strategy is complete as well as making it publicly available via their institutional website. The Agencies plan to implement their policy incrementally and institutional strategies are required by March 2023.
- Additionally, researchers will be required to incorporate DMPs (Data Management Plan) into funding applications starting in Spring 2022. VIU will be required to bolster supports and resources to faculty to ensure they remain competitive for Tri-Agency funding.
- Finally, the Tri-Agencies will phase in a requirement for researchers to deposit their data in line with open access policies. This requires that faculty access to systems and services to store, describe, and archive their data in a way that other researchers/ students can access and use.

<sup>&</sup>lt;sup>1</sup>The institutions which will be required to create RDM strategies are postsecondary institutions and research hospitals eligible to administer Tri-Agency funds. See both the <u>Tri-Agency RDM Policy</u> and <u>Statement of Principles</u> on Digital Data Management, which outline expectations and responsibilities for RDM in the academic community. For definitions of RDM terms in this document, please refer to the <u>CASRAI Research Data Management Glossary</u>.

## Importance of Research Data and Research Data Management at VIU

VIU is committed to the creation and sharing of knowledge. VIU's Strategic Plan: *People, Place, Potential* identifies bold and inspiring goals related to Scholarship, Research and Creative Activity. Embedded in this plan is a commitment to co-create and share knowledge by growing to be the region's hub for research and expertise.

VIU's Academic Plan: *Weaving our Journey Together* aligns with this commitment and incorporates a goal to increase the number of students at VIU who will have an opportunity to engage in research, inquiry, and discovery learning as well as supporting faculty research. VIU will ensure that student's early experiences in research are positive and that they are exposed to best practices in research data management.

The SRCA (Scholarly Research and Creative Activities) Plan: *Transforming Learning through Knowledge Creation* commits to the development of a researcher development program called EDGE and to enhancing the sharing and impact of SRCA via the creation and implementation of the institutional Research Data Management Strategy.



### Scope of this Strategy

This strategy applies to all scholarship, research and creative activity undertaken by employees and students at VIU. The aim is to support the VIU community with the requisite systems, services and supports to enable best practices in research data management to elevate the discovery of knowledge outputs originating within the institution.

## **Guiding Principles**

- VIU recognizes that data are an important research output and as such, VIU is committed to providing its research community with the knowledge, tools, services and supports to create, manage, store and share research data.
- VIU supports the FAIR principles and aims to ensure that our data management processes and policies are created to support discovery. We recognize that data have to be secure and accessible well into the future.
- 3. VIU recognizes OCAP and CARE principles related to Indigenous data and research.
- Data management planning represents a significant change for VIU researchers and VIU aims to support its development through open and transparent communication, collaboration across the institution and user-centered service provision.
- As much as possible, resources to support implementation of the RMS should result from cost recovery via external grants, repurposing existing resources, and collaborative internal and external resourcing.

## The Strategy

#### Goal 1: Build awareness and capacity in research data management planning

OBJECTIVES	MILESTONES AND METRICS	STRATEGIES
1.1 Build DM literacy in the VIU research community	<ul> <li>A communication plan will be developed by April 2023 to ensure VIU researchers understand the new Tri-Agencies DM requirements.</li> <li>DM components will be integrated into all internal VIU grants by spring 2024.</li> </ul>	<ol> <li>The DRI (Digital Research Infrastructure) working group will develop a communications plan targeted at building awareness and compliance with the research community at VIU.</li> <li>Incorporate DM into VIU internal grant submissions for faculty and students (i.e. VIURAC, REACH).</li> </ol>
1.2 Create a community of practice.	<ul> <li>RDM Advisory committee in place by spring 2023.</li> <li>DM best practices shared on the DM webpage by January 2024.</li> </ul>	<ol> <li>Identify champions to help promote RDM.</li> <li>Create an RDM advisory committee including representatives from IT, SCRA, OGS, OIEE and the Library.</li> <li>Identify and promote DM case studies to highlight best practices to the VIU community on a DM web page.</li> </ol>
1.3 Create training program and materials.	<ul> <li>A module for DMP will be developed and launched in the EDGE program by the fall of 2023.</li> <li>A module on DMP related to research with Indigenous partners will be developed and launched by fall 2024.</li> <li>Training opportunities on VIU's existing research software and how to access data sets will be developed and offered by 2024.</li> <li>Two DMP workshops will be held annually between 2023-2026.</li> <li>A set of user friendly handouts and guides will be created and available on the DM website by the spring of 2024.</li> </ul>	<ul> <li>6. The SRCA Office will develop a module in the EDGE program targeted towards faculty and students to build foundation knowledge and skills in DM. New faculty who engage in research will be encouraged to take this module early in their appointment. This will include user friendly handouts and guides web content with an FAQ page building on content already created (https://library.viu.ca/datamanagement)</li> <li>7. The Library, SRCA and the Office of Indigenous Education and Engagement will work with Indigenous researchers and partners to develop a module in the EDGE program to support Data Management Plans (DMP). This module will recognize that data created in the context of research by and with First Nations, Métis, and Inuit communities, collectives and organizations will be managed according to principles developed and approved by those communities, collectives and organizations, and in partnership with them. (cont)</li> </ul>

OBJECTIVES	MILESTONES AND METRICS	STRATEGIES
1.3 Create training program and materials. (cont)		<ol> <li>Additionally, it will highlight 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 in DMPs. SRCA, IT and the Library will offer training on existing software to support use (SPSS, Nvivo, Survey Monkey, Qualtrics, Zotero, ORCID)</li> <li>IT and the Library will develop a series of user-friendly handouts/guides to support faculty and students with the design and implementation of DMP's.</li> <li>For the first 3 years of the strategy, 2 DMP workshops will be held annually hosted by SRCA, the Library</li> </ol>
1.4 Support staff professional development in DMP.	<ul> <li>SRCA, IT and the Library will report out on professional development activity related to DM annually starting 2023.</li> <li>Resources to support instruction in DM for students will be developed and available by fall 2024.</li> <li>Staff to continue to participate in Tri-Agencies RDM consultations and professional development opportunities.</li> </ul>	<ul> <li>and IT Services.</li> <li>10. SRCA, IT and the Library will identify and support training and professional development among their staff to implement the DM Strategy.</li> <li>11. CIEL, Library and SRCA will collaborate to offer professional development targeted towards faculty teaching DM in their courses.</li> </ul>

#### Goal 1: Build awareness and capacity in research data management planning



#### Goal 2: Create sustainable supportive systems and infrastructure

OBJECTIVES	MILESTONES AND METRICS	STRATEGIES
2.1 Align Research Ethics application process to integrate Data Management Planning.	<ul> <li>The REB (Research Ethics Board) application will incorporate DMP questions by September 2023.</li> </ul>	<ol> <li>The REB and the Research Ethics Officer will incorporate DMP into the form using a consultative process with researchers.</li> </ol>
2.2 Develop a local and cloud compute strategy for research purposes which includes secure access to research computing resources such as secure data storage and factors in long term storage costs.	<ul> <li>IT will communicate access for student storage of research data by fall 2024.</li> <li>IT will explore secure data storage for students via VIU email profiles.</li> <li>Options for researchers to store large datasets will be shared by August 2024.</li> <li>Adequate repository services will be reviewed and maintained throughout the DMS.</li> </ul>	<ol> <li>IT will identify options to provide students with access to secure storage for their research data.</li> <li>IT will investigate a digital lab book that is linked to data storage.</li> <li>IT will explore options to provide researcher with sufficient local computing power (big data).</li> <li>The Library will provide, or support access to, repository services or other platforms that securely preserve, curate and provide appropriate access to research data.</li> </ol>
2.3 Create and communicate streamlined processes to obtain access to software.	<ul> <li>Instructions on how to access research software (data collection and storage) will be made available on the DM website by fall 2024.</li> </ul>	<ol> <li>IT will provide user centered processes and communicate methods to access existing software for researchers and students.</li> </ol>
2.4 Coach researchers in DM during grant applications to set them up for success.	<ul> <li>A guide to communicate best practices will be developed and shared with researchers at the beginning of their grant application.</li> <li>Exemplar DMP's will be available on the DM website by fall 2023.</li> <li>Materials to convey what services and supports exist at VIU will be developed and available on the DM website by fall 2024.</li> </ul>	<ol> <li>Guide researchers on how to properly manage data in accordance with the principles outlined in the Tri-Agency Statement of Principles on Digital Data Management, including the development of data management plans;</li> <li>SRCA will provide exemplar DMP's for faculty to utilize during the grant application process as well as a guide to communicate best practices.</li> <li>IT will provide material to communicate what tools and resources exist at VIU for faculty to embed into their DMPs.</li> <li>The Library will provide material to communicate what tools and resources exist at VIU for faculty to embed into their DMPs.</li> </ol>

OBJECTIVES	MILESTONES AND METRICS	STRATEGIES
3.1 Identify and secure resources to support the implementation of the DMS, with an eye to external funding to ensure the RDM program is sustainable.	<ul> <li>The 2023-24 budget planning process will receive a submission aligned to RDM proposing an end-to-end library resources to support researchers.</li> <li>Key contacts in SRCA, IT and the Library for DM will be identified and indicated on the DM webpage by fall 2023.</li> <li>A menu of costs will be developed by spring of 2024.</li> </ul>	<ol> <li>SRCA, IT and the Library will identify resources required for the implementation of the DMS in the 2023-24 budget planning process. Ensure stable funding for access to data storage and sharing (i.e. ORCID, datasite, dataverse) and data collection (analysis software and referencing systems).</li> <li>SRCA, IT and the Library will identify a key point person in each depart- ment that will be the contact on DM for researchers.</li> <li>IT and SRCA will develop a menu of costs for data storage to provide researchers with figures for their grant proposals.</li> </ol>
3.2 Identify and utilize existing resources where available.	<ul> <li>Relevant resources will be shared annually at the Digital Research Infrastructure (DRI) Working group meeting and hosted on the DM webpage.</li> </ul>	<ol> <li>SRCA, IT and the Library will identify resources developed at other universities, federal agencies and communities of practice to incorporate into VIU's DMS (i.e. exemplar DMP's to share with researchers in grant proposals, training slide decks).</li> </ol>
3.3 Update or create policies, processes, and procedures, to support research data management.	<ul> <li>A review of policies associated with research data management will be completed by fall of 2025 ensuring alignment with broader data governance at VIU.</li> <li>New policies and procedures will be in place by fall 2027.</li> <li>Explore process and best practices regarding research data access and secure storage when collaborating with international partners</li> </ul>	5. SRCA, Library and IT to work with a policy analyst to scan external policies and procedures associated to supporting DM and review existing VIU policies and procedures to identify and address gaps.

#### Goal 3: Align policies and resources to support best practices in Data Management

## Final Stage: Assembling and Launch VIU's RDM Strategy

Based on the clarity and input provided at the May 2022 workshop, the DRI working group articulated the actions and resources necessary to realize our desired future state and address known gaps in our RDM system. This strategy was developed over the summer of 2022 and shared with participants of the DM workshop in November. It was then presented to VIU's Senior Management Team for input and approval in the fall of 2022. Once approved, the RDM strategy was shared internally with the VIU community via an announcement as well as externally on our Research Data Management webpages. Relevant Tri-Agency and Compliance bodies were notified via email by March 2023. Additional targeted strategies to raise awareness and share resources for different campus stakeholder communities are embedded within the strategy.

### Implementation, Oversight and Review

To move from a planning focus to an implementation focus, a terms of reference for a Research Data Management Steering Committee was created to monitor progress and report out on the Research Data Management Strategy to VIU's Senior Management Team (SMT). The Research Data Management Steering Committee will incorporate representatives from the SRCA

Office, the Library and IT Services as well as two faculty representatives. The Committee will meet four times each year to monitor the progress on the DMS, to identify and coordinate resourcing of the DMS and to prepare updates for SMT.



#### Acknowledgements

This strategy was led by Nicole Vaugeois, Associate Vice-President, Scholarship, Research and Creative Activity, David Alexander, Chief Librarian, and Omair Quraishi, Chief Information Officer with substantial input from Dana McFarland, Librarian and Coordinator for eResources and Scholarly Communication, Ben Hyman, VIU's former Chief Librarian and Karl Childress, Acting Chief Information Officer. Thank you to the many employees that contributed their input on the RDM survey and to those who attended the workshops.

This development template builds upon the work of Kathleen Shearer and the Portage Institutional RDM Strategy Working Group.

## Appendix A: Strategy Development Stages and Activities

To develop the RDMS, VIU undertook the following activities in four stages identified in the Alliance Research Data Management template.

#### First Stage: Building Awareness and Capacity in RDM at VIU

Since learning about the Tri-agency policy review process, VIU proactively engaged in preparing for the changes to ensure that the institution remained compliant and to ensure our researchers were supported appropriately.

Some of these activities included:

- In 2019, the Senior Management Team created a Digital Research Infrastructure Working Group with input from the AVP Scholarship, Research and Creative Activity, Information Technology and the Library. This group developed a work plan to build capacity for RDM. They met quarterly and reported on progress annually to the Senior Management Team.
- In 2021, SRCA and the Library began to host capacity building events with VIU faculty to build awareness and skills in research data management planning. Initially these were held with Tri-Agency grant holders. VIU grant facilitators began to identify best practices and resources to help guide future submissions for Tri-Agency grants.
- In 2020, SRCA and the Library joined the open source collaborative data repository network, Borealis, the Canadian Dataverse

Repository to support faculty to upload and share data sets more openly in the research ecosystem.

- During 2020-21 the focus was on building a better understanding of DM policy expectations and templates to develop the RDMS to meet the March 2023 Tri-agencies deadline. Representatives from SRCA, IT and the Library participated in a virtual workshop from October 25-28th, 2021 called "Putting the Tri-Agency Policy into Practice: Workshopping your Institutional Data Management Strategy". This workshop provided opportunities to deepen understanding about what is expected in the strategy as well as providing tools and resources to guide VIU work.
- In 2022, VIU began to broaden the research data management community to include Research Ethics, Graduate Studies, and researchers. The community was invited to a day-long workshop in May 2022 to share the assessment data and identify priorities for the RDM strategy. This strategy has been built with data captured from this workshop.

## Second Stage: Assessing the Current State of RDM at VIU

The second stage of the process involved assessing the current state of research data management including services, resources, staffing, and external supports used at Vancouver Island University.

 In 2021 as part of the "Putting the Tri-Agencies Research Data Management Policy into Practice" workshop, assessment tools were shared that allowed institutions to identify and assess the levels of resources they have available for RDM. The VIU team attending the workshop completed the MAMIC (RDM Maturity Assessment Model in Canada) assessment which graded VIU's current supports and identified gaps in VIU's RDMS readiness.

- In preparation for a workshop in May, 2022,
   SRCA, IT and the Library conducted a more detailed inventory of existing RDM supports and services, including those related to:
  - Training and awareness raising resources
  - Data management planning
  - · Indigenous data sovereignty considerations
  - Active data storage
  - Data deposit into repository storage
  - Long-term preservation storage
  - Data access and sharing
  - Data retention
  - Data and metadata quality and standards
  - Privacy, ethical and intellectual property considerations
  - Sensitive data considerations
  - RDM related policies, procedures and or best practices
- In 2022, SRCA created an online survey to assess current practices, awareness and needs in research data management that was shared with a sample of faculty who held internal and external funding. This data provided insight into the types of supports that VIU researchers need to have in place to support their role in RDM.
- Post workshop, this inventory was used to evaluate RDM supports and services in terms of availability, funding, staffing, and sustainability.

#### Third Stage: Envision the Future State of RDM

In order to identify the priorities for our Research Data Management Strategy, the third stage involved envisioning the future state of RDM at VIU. VIU RDM stakeholders were invited to help create a vision of the desired future state for RDM by participating in a day long workshop in May, 2022. The assessment data described in the second stage was shared with participants as foundational knowledge.

One of the goals of the workshop was to identify priorities and a vision for an RDM strategy and needs associated included consideration of factors such as:

- Adequate Staffing and resource levels
- Sources and sustainability of funding
- Training for researchers, students, and staff
- Engaging with internal and external stakeholders and assessing their needs, including First Nations, Inuit and Métis stakeholders
- Awareness raising and increasing adoption of RDM practices
- Identifying intersections with other relevant strategies and/or policies
- Addressing growing data storage needs and changing technologies
- Implementing long-term preservation
   management
- Ethically and securely managing data

#### Fourth Stage: Articulating VIU's RDM Path Forward

The May 2022 workshop engaged RDM stakeholders in an exercise to identify our short, medium and long term priorities to address known gaps in our RDM system and to realize our desired future state. Several guiding principles emerged from this workshop as well as a series of actions and strategies. The draft strategy was shared with the same stakeholders in November 2022 prior to approval by VIU's senior management team. Strategies are embedded to articulate the strategy beginning in January 2023.

### Appendix B: Tri-Agency Strategy Specifications

According to section 3.1 of the <u>Tri-Agency RDM</u> <u>Policy</u>, institutional RDM strategies should include items such as:

Since learning about the Tri-agency policy review process, VIU proactively engaged in preparing for the changes to ensure that the institution remained compliant and to ensure our researchers were supported appropriately.

- recognizing data as an important research output;
- supporting researchers in their efforts to establish and implement data management practices that are consistent with ethical, legal and commercial obligations, as well as tri-agency requirements, including the <u>Tri-Council Policy</u>

Statement: Ethical Conduct for Research Involving Humans – 2nd edition, the Tri-Agency Framework: Responsible Conduct of Research, and other relevant policies;

- promoting the importance of data management to researchers, staff and students;
- guiding their researchers on how to properly manage data in accordance with the principles outlined in the <u>Tri-Agency Statement of</u> <u>Principles on Digital Data Management,</u> including the development of data management plans;
- committing to the adoption of established best practices when developing institutional standards and policies for data management plans;
- providing, or supporting access to, repository services or other platforms that securely preserve, curate and provide appropriate access to research data;
- recognizing that data created in the context of research by and with First Nations, Métis, and Inuit communities, collectives and organizations will be managed according to principles developed and approved by those communities, collectives and organizations, and in partnership with them;
- recognizing 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.

#### **Appendix C: Definitions**

#### Definitions

The following definitions are helpful to create a shared understanding of key terms in this DMS. The definitions were obtained from the Tri-Agency Research Data Management Policy.

#### Data

Data are 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

Research data 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. 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.

#### Research Data Management

Research data management (RDM) refers to the processes applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data. RDM is essential throughout the data lifecycle—from data creation, processing, analysis, preservation, storage and access, to sharing and reuse (where appropriate), at which point the cycle begins again. Data management should be practiced over the entire lifecycle of the data, including planning the investigation, conducting the research, backing up data as it is created and used, disseminating data, and preserving data for the long term after the research investigation has concluded.

#### Data Management Plan

A 'data management plan' (DMP) is "a living document, typically associated with an individual research project or program that consists of the practices, processes and strategies that pertain to a set of specified topics related to data management and curation. DMPs should be modified throughout the course of a research project to reflect changes in project design, methods, or other considerations. DMPs guide researchers in articulating their plans for managing data; they do not necessarily compel researchers to manage data differently" (Tri-Agency Research Data Management Policy, Frequently Asked Questions, Government of Canada 2021).

#### Data Deposit

Data deposit" refers to when the research data collected as part of a research project are transferred to a research data repository. The repository should have easily accessible policies describing deposit and user licenses, access control, preservation procedures, storage and backup practices, and sustainability and succession plans. The deposit of research data into appropriate repositories supports ongoing data-retention and, where appropriate, access to the data.Ideally, data deposits will include accompanying documentation, source code, software, metadata, and any supplementary materials that provide additional information about the data, including the context in which it was collected and used to inform the research project. This additional information facilitates curation, discoverability, accessibility and reuse of the data.

