CARE Data Maturity Model (CARE DMM)

Guidelines for the Governance of Indigenous Data

Riley Taitingfong, Stephanie Carroll, Maui Hudson, Andrew Martinez, Vanessa Smith, Tamara Layden, and Cassandra Sedran-Price

Note to Readers

This document is publicly available and intended for use by any individual or institution engaging with Indigenous data. The CARE DMM was developed through iterative community consultation and is designed to evolve through ongoing feedback from Indigenous communities, practitioners, and partner institutions. An Acknowledgments section will be added to honor the networks, communities, and individuals whose knowledge and guidance shaped this work.

Preferred Citation

Taitingfong, Carroll, Martinez, Hudson, Smith, Layden, and Sedran-Price. 2026. The CARE Data Maturity Model: Guidelines for the Governance of Indigenous Peoples' Data. The Collaboratory for Indigenous Data Governance.

Table of Contents

1. Purpose and Objectives

The CARE Principles for Indigenous Data Governance guide data projects in respecting Indigenous Peoples' rights and interests, as articulated through the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). They are complementary to the FAIR Principles and other data frameworks, and emphasize equitable Indigenous participation, governance, and benefit from the access, use, and stewardship of Indigenous data across all datasets — whether open or restricted.

Since their original publication in 2019, the CARE Principles have been endorsed and engaged by a wide range of data actors and institutions, including data repositories, government agencies, universities, funding bodies, publishing bodies, individual researchers, and corporations. Many have expressed a need for more concrete and actionable guidance for implementing the CARE Principles in practice. In response, a core team was formed in 2023 to develop an assessment tool — the CARE Data Maturity Model ("CARE DMM") — grounded in feedback from communities and practitioners who found high-level frameworks difficult to apply in day-to-day contexts.

Drawing on the structure of the FAIR Data Maturity Model, the CARE DMM provides a framework for assessing, measuring, and improving the governance of Indigenous data within projects, institutions, and data ecosystems — wherever Indigenous data currently resides. The CARE DMM operationalizes CARE through a set of measurable indicators that help data actors identify gaps, benchmark progress, and create enabling conditions for Indigenous data governance in alignment with Indigenous sovereignty and authority.

Specifically, the CARE DMM is designed to provide data actors with a structured framework for assessing the implementation of CARE-aligned institutional practices that support Indigenous data governance. By translating the high-level CARE Principles into measurable, actionable indicators, the model offers steps for developing and refining policies, procedures, and data management practices that honor Indigenous rights and priorities.

Grounded in the rights affirmed by UNDRIP — and in treaties and constitutional rights anchored in local and national contexts — the model supports the principle of "data for governance": ensuring Indigenous Peoples have access to timely, accurate, and relevant data to strengthen self-governance and achieve equitable outcomes. It also upholds the principle of "governance of data": emphasizing responsible stewardship of Indigenous data across ecosystems and lifecycles, including when data are held outside Indigenous-controlled systems. These dual commitments reflect the full scope of the CARE Principles and underscore the CARE DMM's purpose.

Through sustained and accountable implementation of the CARE DMM, data actors can progressively align their data ecosystems with foundational CARE principles — including those that facilitate Indigenous Peoples' and community use and reuse of data, reinforce the authority of Indigenous Peoples to inform policy decisions about their data, and generate data that reflect community values, cultural governance, and lore. Recognition of Indigenous authority also means that data governance protocols must be determined and led by Indigenous nations and communities themselves, including stewardship decisions for Indigenous data held by external entities. Ethical governance demands that Indigenous Peoples' rights and well-being remain central throughout the entire data lifecycle — from design and collection through analysis, sharing, and reuse — and that Indigenous Peoples define the benefits, identify harms associated with the use of their data, and determine future uses.

The CARE DMM supports and advances the adoption of the CARE Principles across disciplines, strengthens ethical, equitable, and community-centered data governance. Through sustained engagement, the CARE DMM can guide data actors and institutions toward data ecosystems that deliver collective benefit, uphold authority to control, fulfill responsibilities, and practice ethics in a manner defined by Indigenous Peoples themselves.

The objectives of the CARE Data Maturity Model are to:

1. Guide users and stewards of Indigenous data to align with and adhere to the protocols and values of the Indigenous community or communities to whom the data relate or originate, and to create pathways for meaningful engagement with those communities;
2. Support data actors and institutions external to Indigenous communities in upholding Indigenous rights, authority, and ethics through accountable internal practices;
3. Provide a structured framework for external data actors to assess their alignment with and implementation of CARE-aligned data practices — including the quality and governance of their data ecosystems and infrastructures;
4. Demonstrate how CARE complements, deepens, and extends FAIR-aligned data practices by addressing considerations beyond FAIR's original scope;
5. Translate the CARE Principles into measurable, actionable indicators that data actors and Indigenous communities can use to monitor, evaluate, and improve CARE-aligned data stewardship.

2. Use of This Document

Echoing the Global Indigenous Data Alliance (GIDA) communiqué "CARE Directs Us Home," the CARE DMM underscores that data governance is not merely a technical framework but a cultural and political imperative. It calls on institutions, researchers, and standards bodies to uphold and prioritize the standards set by Indigenous Peoples and communities when working with Indigenous data. Honoring Indigenous community standards plays a key role in advancing Indigenous Data Sovereignty (IDSov) and Indigenous Data Governance (IDGov). These standards are rooted in the specific knowledge systems, rights, and cultural frameworks of each community. By following locally developed principles and protocols, data practices and the technologies that enable them are more likely to reflect Indigenous values, protect inherent rights, and contribute to self-determined futures. Importantly, embracing CARE also supports long-term sustainability — many Indigenous data governance systems were designed to sustain life and well-being across generations, offering models of stewardship that serve all life.

This document serves as both a reference and a practical guide for data actors engaging with Indigenous data. It outlines the conceptual foundations of IDSov and the CARE Principles, explains the rationale for developing the CARE DMM, and provides detailed specifications for its application. It offers concrete mechanisms to help data actors assess their progress toward CARE-aligned data governance, using measurable indicators applicable at different stages — from before collection, through storage, to ongoing use and reuse. These assessment tools are designed to be adaptable to the diverse roles and responsibilities of individuals, publishers, repositories, funders, and policymakers, ensuring that equity, Indigenous-centered control, and community-defined benefit are embedded across all points in the process.

The primary audience for this document is data actors representing institutions external to Indigenous communities — researchers, data stewards, repositories, funders, standards bodies, and others who hold, access, or make decisions about Indigenous data. Through a lens of sovereignty and responsibility, the CARE DMM centers community-defined protocols and prioritizes ethical, benefit-sharing data practices. Grounded in Indigenous rights and governance priorities, and drawing on established maturity model frameworks, the model supports iterative improvement: enabling organizations to evaluate their current position, identify gaps, and implement concrete steps toward more robust, equitable, and respectful Indigenous data governance.

Indigenous community leaders may also find this document valuable in educating external data actors with whom they work or who steward data derived from their communities. The CARE DMM belongs to — and was designed with — Indigenous communities, and communities may use it as a resource for assessing whether external partners are working in alignment with CARE values. At the same time, institutional and individual data actors are encouraged to recognize that the CARE DMM is not a substitute for genuine relationship-building, community consent, and culturally grounded engagement. Real engagement means creating the conditions necessary for Indigenous Peoples to actually govern their data within institutional spaces — not merely checking boxes.

3. Context and Definitions

This section provides foundational context for understanding the CARE DMM. Readers already familiar with Indigenous Data Sovereignty, the CARE Principles, and related frameworks may wish to skip ahead to Section 4. Others may find this section a useful orientation. Where appropriate, specific frameworks and resources are referenced for deeper reading.

a. Defining IDSov and IDGov

Indigenous Data Sovereignty ("IDSov") is the right of Indigenous Peoples and nations to govern the collection, ownership, and application of their own data. It derives from the inherent rights of Indigenous Peoples to govern their own communities and determine the use of their lands, resources, and knowledge. Indigenous Peoples have always been experts in data, maintaining roles, responsibilities, and protocols for the care and stewardship of their knowledge systems since time immemorial.

Positioned within a human rights framework, IDSov has been affirmed through court cases, treaties, and other forms of recognition, including international mechanisms such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Central to IDSov is the understanding that knowledge belongs to the collective and is fundamental to Indigenous identity and self-determination.

While IDSov establishes the rights to control and govern the use of Indigenous data, Indigenous Data Governance ("IDGov") refers to the specific mechanisms, principles, and practices that uphold those rights across multiple scales and contexts.

b. Colonial Legacies in Data

Indigenous Peoples have long faced significant inequities and exploitation in data practices. Open science, open data, big data initiatives, environmental monitoring programs (including GIS and remote sensing), and digital platforms have often failed to adequately engage with Indigenous rights and interests. These inequities are intensifying in the era of artificial intelligence and digital platforms.

Historically, researchers and institutions working with Indigenous communities have frequently assumed ownership of data derived from those communities — sharing, commercializing, or withholding data with little meaningful obligation to benefit the communities involved. Indigenous data has been extracted, shared, and commercialized without meaningful consultation, consent, or benefit-sharing, reinforcing colonial legacies (IWGIA 2020; Kukutai and Cormack 2020; PLOS 2023). These practices have often been inconsistent with Indigenous cultures, collective rights, and community protocols, creating tensions between protecting Indigenous rights and supporting broader data-sharing agendas.

c. National and International Recognition of Indigenous Rights and Frameworks

Since the 1970s, a global resurgence in discourse around Indigenous knowledge, identities, and rights has driven the assertion of IDSov (Lightfoot 2016). The emergence of new technologies, economic systems, climate change pressures, and globalisation have further accelerated the need for Indigenous-led data governance solutions. As the Global Indigenous Data Alliance (GIDA) emphasizes in CARE Directs Us Home:

> *"Data governance encompasses strategic decision-making across the entire data lifecycle, from conceptualization, creation, and collection to analysis, interpretation, sharing, and storage. IDGov ensures that Indigenous Peoples' definitions and principles regarding data at local, regional, or national levels are implemented, reflecting their worldviews and priorities while enabling self-determined, data-driven decision-making." (GIDA 2024, p. 2)*

This governance is especially critical because much Indigenous-related data is held by non-Indigenous institutions. Networks such as Te Mana Raraunga Māori Data Sovereignty Network (Aotearoa/New Zealand), the US Indigenous Data Sovereignty Network, the Maiam nayri Wingara Aboriginal and Torres Strait Islander Data Sovereignty Collective (Australia), and others have been central to articulating these principles, as have frameworks like the First Nations principles of OCAP® (Ownership, Control, Access, and Possession) developed in Canada in the 1990s (FNIGC n.d.; Carroll et al. 2020).

Together with the CARE Principles — designed to complement the FAIR Principles by centering people and purpose over data utility for automated systems — these initiatives reflect Indigenous worldviews that emphasize collective ownership, community benefit, ethical governance, and long-term sustainability across generations (Carroll et al. 2020; GIDA 2024).

Table 1: Key Indigenous Data Sovereignty Networks, Frameworks, and Milestones

Network / Framework / Initiative	Region / Date	Key Contributions
First Nations OCAP® Principles (Ownership, Control, Access, Possession)	Canada, 1990s	Foundational framework asserting First Nations' rights to data governance. Developed by the First Nations Information Governance Centre (FNIGC).
FAIR Principles alignment work	Global, 2014	Aimed to shift the role of Indigenous Peoples from "subjects of study" to "active decision-makers" regarding how their data is collected, shared, and used. CARE was designed to complement and extend FAIR.
Research Data Alliance (RDA) International Indigenous Data Sovereignty Interest Group	International, 2017	Provided a chronological lineage of the Indigenous Data Sovereignty movement, tracing its evolution from foundational local

		efforts to global policy frameworks. Hosted the creation of the CARE Principles for Indigenous Data Governance.
Te Mana Raraunga (TMR) Māori Data Sovereignty Network	Aotearoa/New Zealand, 2015	Advocates for Māori control over data; develops principles for Māori Data Sovereignty; works with NZ government on ethical governance. TMR hosted numerous workshops and developed frameworks for Māori data governance.
Te Kāhui Raraunga (TKR)	Aotearoa/New Zealand, YEAR	Authors of the Māori Data Governance Model, providing a comprehensive framework for how Māori data governance should operate in practice. (www.kahuiraraunga.io)
US Indigenous Data Sovereignty Network (USIDSN)	United States, 2016	Develops research, policy, and practice innovations in IDSov. The associated Collaboratory provides training, outreach, publications, and webinars, and hosts the Indigenous DataSET Hub.
Maiam nayri Wingara Aboriginal and Torres Strait Islander Data Sovereignty Collective (MnW)	Australia, 2017	Advances Indigenous control of Indigenous data. Developed IDSov Principles, engaged with federal and state governments, and hosted the National IDSov Summit in 2023.
Collaboratory for Indigenous Data Governance	United States/International, 2018	Builds upon and supports the movement to develop new institutional frameworks that center the terms of Indigenous Peoples around research and data partnerships through institutional policy and practice changes. Developed CARE criteria and the maturity model, and CARE Guidelines for Publishers.
Global Indigenous Data Alliance (GIDA)	Global, 2019	Advances IDSov and IDGov globally. Created and distributed the CARE Principles, developed CARE criteria and the maturity model, hosted the IEEE Recommended Practice consultation, and published the 12 Rights to Data.

GIDA-Sápmi / Sámi Research Data Governance	Sápmi (Norway, Sweden, Finland), 2020	Advocates Sámi data governance, especially in relation to language, knowledge, land, and environmental data.
Pacific Data Sovereignty Network	Pacific Islands, 2020	Focuses on asserting Indigenous and community rights in data for Pacific peoples; addresses climate, environment, and cultural data sovereignty.
Equity for Indigenous Research and Innovation Coordinating Hub (ENRICH)	United States and Aotearoa/New Zealand, 2019	A social justice data initiative linking IDSov/IDgov initiatives and Local Contexts to support Indigenous control of cultural heritage and data. Advances research, education, training, and hosts global webinars on intellectual property and Indigenous data rights.
CARE Principles for Indigenous Data Governance	Global, 2019	Collective Benefit, Authority to Control, Responsibility, Ethics. Developed by the International Indigenous Data Sovereignty Interest Group within the Research Data Alliance and first articulated at an Indigenous-led workshop during International Data Week in Botswana in 2018.
Asian Indigenous Knowledge and Data Sovereignty (IKDS) Framework	Asia-Pacific, 2023	Provides a framework for asserting Indigenous knowledge and data sovereignty in Asian and Pacific Indigenous contexts. (aippnet.org)
Indigenous Data Exchange	Global, 2023	Leverages existing IDSov/IDGov networks' ongoing efforts to advance policy and practice, and create and share tools for the governance of Indigenous data (e.g., implementation of the CARE Principles) across the research data ecosystems.
Canadian Indigenous Data Sovereignty Network (emerging)	Canada, 2023	An emerging network convening First Nations, Inuit, and Métis scholars, technicians, and communities to share IDSov/IDGov knowledge, training, and best practices. Closely connected with the First Nations Information Governance Centre and its OCAP® principles.
Hawaii efforts		

Indigenous Data Alliance	United States/International, 2025	An independent non-profit organization catalyzing change through data and policy by Indigenous Peoples for Indigenous Peoples on Indigenous lands.

Reference: https://fnigc.ca/news/gida-care-directs-us-home-prioritizing-indigenous-peoples-community-standards/

d. Origins of the CARE Principles

The International Indigenous Data Sovereignty Interest Group within the Research Data Alliance first articulated the CARE Principles at an Indigenous-led workshop during International Data Week in Botswana in 2018. The Principles were formally published in 2019 (Carroll et al. 2019).

While FAIR provides the structural framework essential for data discovery — prioritizing the technical qualities and machine-readability of data objects — it does not fully address who benefits from the data, who holds authority over it, or how it aligns with cultural values. FAIR was designed primarily for Western scientific data management and does not center the relational, political, or spiritual dimensions of data that are central to Indigenous governance systems. Additionally, FAIR does not address what are sometimes called "closed" or restricted data — where Indigenous communities specifically determine that certain data should not be widely shared.

CARE was developed in direct response to these gaps, and was structured to complement FAIR so that practitioners working within FAIR frameworks could more readily integrate CARE requirements. By centering relationships to the data's human and non-human sources, cultural protocols, and community-defined purposes — including purposes shaped by ancestral guidance and intergenerational responsibility — CARE addresses Indigenous worldviews that emphasize collective ownership, community benefit, and ethical governance. Together, FAIR and CARE ensure data are both technically reusable and ethically responsible, summarized in the maxim: Be FAIR and CARE.

The four CARE Principles are:

- **Collective Benefit** calls for designing data ecosystems that enable Indigenous Peoples to derive tangible and intangible benefits from the use of their data.
- **Authority to Control** affirms Indigenous rights and interests in their data, including the ability to determine how, when, and by whom it is collected, accessed, or shared.
- **Responsibility** emphasizes building relationships, fostering capacity, and ensuring that all data actors engaging with Indigenous data contribute to Indigenous self-determination, collective well-being, and the well-being of the data itself.
- **Ethics** centers Indigenous rights and well-being throughout the data lifecycle, ensuring that practices are aligned with Indigenous values, laws, protocols, and ethical frameworks.

Reference: *Operationalizing the CARE and FAIR Principles for Indigenous Data Futures (Carroll et al. 2021). https://www.nature.com/articles/s41597-021-00892-0*

e. Implementation of the CARE Principles

The uptake of the CARE Principles across multiple domains — including scientific publishing, data repositories, government agencies, funding bodies, individual researchers, and corporations — has created a pressing demand for practical tools to translate these high-level principles into concrete, measurable actions. The CARE DMM emerged from years of feedback indicating that while many actors found the Principles compelling, they lacked the specific guidance needed to move from aspiration to implementation.

Early adopters illustrate how CARE can be embedded into diverse contexts, including:

- The 2020 AIATSIS Code of Ethics for Aboriginal and Torres Strait Islander Research, which builds on the CARE principles to construct a research framework;
- The Smithsonian Institution, which has incorporated CARE into its collections stewardship policies, including the development of "Collection CARE Notices" for sensitive Indigenous materials;
- The Open Data Charter, which has drawn on CARE to refine principles such as "Open by default" so that openness is balanced with Indigenous rights and decision-making authority;
- The 2024 LICCI Policy Brief, which operationalizes CARE by centering Indigenous sovereignty, insisting on benefit-sharing, demanding FPIC and accountability, and embedding ethics in both policy and research; and
- UNESCO's 2021 Recommendation on Open Science, which takes CARE's community-centered data governance approach and integrates it into the global open science framework, ensuring openness does not override Indigenous rights but instead operates alongside sovereignty, ethics, and equity.

These examples demonstrate that CARE implementation requires both structural mechanisms — such as agreements, metadata standards, and policy directives — and relational processes that center Indigenous leadership, benefits, and governance authority. The CARE DMM provides the connective tissue between these two dimensions.

The table below illustrates how CARE's principles align with UNESCO's 2021 Recommendation on Open Science as one example of international policy uptake. This table is provided in the Appendix for reference.

4. The CARE Framework

a. Data Actors

A wide range of data actors may use the CARE DMM. The model is primarily designed for actors at the following levels:

- Institutional actors: universities and research institutes, non-profits (cultural heritage organizations, advocacy groups), for-profit entities (technology companies, data analytics firms), government agencies, scientific institutes, healthcare institutions, museums, and archives.
- Group-level actors: research teams, data governance committees, funding agencies, and data repositories (including institutional archives and data platforms).
- Individual actors: researchers, data stewards, community members managing local archives.

Each has distinct roles, resources, and responsibilities in the stewardship of Indigenous data. For example, a researcher may use the model to guide respectful engagement and consent processes; a philanthropic funder might apply it to assess grantee alignment with community-defined outcomes; and a repository could use it to implement metadata systems that recognize Indigenous provenance. It is critical that all these actors engage with the CARE Principles because the governance of Indigenous data, and the outcomes that flow from its use, are shaped by decisions made at every stage of the data lifecycle, across all types of institutions and relationships.

The CARE DMM is designed primarily for data actors external to Indigenous communities — those who work with, hold, or make decisions about Indigenous data but are not themselves members of the communities from which that data originates. Indigenous community leaders and data stewards may also find this framework useful in evaluating external partners and setting expectations for CARE-aligned engagement.

b. Indicators

The indicators used in the CARE DMM serve to operationalize the CARE Principles by clarifying how one can determine whether a principle is being applied in practice. These indicators act as proxies for broader commitments, meaning they do not need to fully operationalize an entire principle but instead focus on concrete, measurable aspects that reflect key elements of that principle. By translating broad aspirational commitments into specific criteria, the indicators make it possible to assess adherence to CARE in tangible ways.

Each indicator is composed of multiple sub-indicators or criteria that are more specific and measurable. Together, these criteria provide focused ways to evaluate different dimensions of an indicator, capturing the complexity and nuance of applying CARE Principles in real-world contexts. Each criterion is disaggregated by data actor, recognizing the varied roles and responsibilities in Indigenous data governance. This actor-specific structure enables a tailored assessment of how CARE is upheld across diverse data actors involved in data stewardship and use.

To ensure the framework is functional for different needs, the indicators can be approached from two distinct directions:

When implementing the CARE Indicators, a data actor can choose to enter the framework based on either (A) an Actor Role or (B) a Core Principle. If the goal is institutional alignment, a data actor selects their specific category (such as Funder or Repository) to view a curated list of responsibilities and criteria tailored to their unique levers of influence. Alternatively, if the goal is to address a specific gap in a particular area, a data actor may select a Core Principle — one of the four letters of CARE (Collective

Benefit, Authority to Control, Responsibility, or Ethics) — to see how every entity across the data ecosystem contributes to that single objective.

By providing these two pathways, the framework allows for a targeted "role-based" checklist or a holistic "principle-based" audit, both of which utilize the DMM phases to move from initial recognition to community-led innovation.

c. Value Alignment

The CARE DMM is designed to guide actors along different pathways of alignment with the CARE Principles. This approach avoids prescriptive or linear maps, instead allowing users to assess their current position within a framework of staged growth. Rather than ranking indicators by priority, the model offers entry points that help actors identify where to begin or deepen their engagement, depending on their current level of alignment and capacity.

Together, entry points and maturity ratings offer a roadmap for iterative growth that is responsive to — and accommodates — the diversity of data actors, while consistently centering Indigenous authority, collective benefit, responsibility, and ethics — regardless of where a data actor enters the model.

d. Rethinking Research in the CARE Context

Traditional conceptions of research often treat data as following a one-way, extractive process: data are collected from communities, analyzed externally, and disseminated in ways that primarily benefit researchers or institutions (Smith 1999; Denzin et al. 2008). Within the CARE framework, this understanding must be fundamentally reframed. Research should be approached as a collaborative, relational practice that prioritizes the interests, knowledge systems, and governance of Indigenous communities while following a bilateral process that, in some meaningful way, gives back to and benefits the community. This requires acknowledging the historical and ongoing harms caused by extractive research methods and actively centering ethical, reciprocal engagement.

In policy and data governance contexts, this reframing expands the definition of research beyond conventional peer-reviewed outputs. While peer verification remains important for credibility, research under CARE principles also values iteration, adaptability, and responsiveness to evolving community needs. Methods should be co-designed with Indigenous partners, ensuring that every stage — from conceptualization to dissemination — aligns with community priorities, cultural protocols, and ethical standards.

In the CARE framework, relationships supersede the narrow idea of research. The central tenet is not knowledge extraction but the cultivation of trust, reciprocity, and long-term connection with Indigenous communities. Relationships should be treated as a guiding force: they require iterative engagement, reflection, and co-assessment, ensuring that learning and adjustment happen together and over time. Data actors should turn to relationships with Indigenous communities and stakeholders as their primary tool for accountability, empowerment, and collective benefit, rather than relying on external evaluation or institutional benchmarks alone.

Relationships, like the CARE Principles themselves, are living and participatory. They must be guided by the communities whose data are at stake, responsive to shifting priorities, and firmly grounded in Collective Benefit, Authority to Control, Responsibility, and Ethics. Building and sustaining these relationships provides the real foundation for meaningful measurement, trustworthy evaluation, and outcomes that serve both community-defined goals and broader policy needs.

e. Measurements and Evaluation Methods

The CARE DMM offers a range of measurement options and frameworks that users can adapt to their specific context, with precedence always given to community-defined metrics. This approach recognizes that there are many valid ways to evaluate CARE implementation across different contexts and actors. We encourage users to treat this tool as a starting point for dialogue with Indigenous communities, and for those communities to use it as a potential (but non-exhaustive) resource in assessing the applicability of CARE principles in engagements with external partners.

Measurement of CARE-aligned practices leverages community-defined priorities alongside quantitative, qualitative, process, and outcome-based evidence to holistically track implementation. By offering multiple pathways to measurement, the model ensures that communities lead in defining what success looks like while enabling diverse actors to demonstrate meaningful progress toward CARE-aligned practice. Detailed measurement tools are described in Section 7.

5. Implementation: How to Use the CARE DMM

The CARE DMM is a flexible, cyclical framework for self-assessment, alignment, and continuous improvement around Indigenous data governance. It is a four-part system designed to move users from theory to practice, supporting a wide range of data actors, capacities, and starting points. Together, these four components form a continuous improvement loop:

Entry Point Assessment	Phased Roadmap	Maturity Ratings	Measurement Tools
Where do I start? Identifies the most appropriate starting point by aligning organizational capacity and prior experience with CARE principles. The starting point aligns with one of the phases (0–7).	**What do I do next?** Breaks the progression toward CARE-aligned practice into a structured sequence of phases (Phases 0–7), each with defined activities.	**How far along am I?** Assesses the level of implementation for each indicator, ranging from absence to community-driven practice (0–3).	**How do I track progress?** Provides ways to track and demonstrate progress using numbers, stories, policies, or outcomes.

Before engaging with the Data Maturity Model, actors often ask: "Where do I start?" Because data actors come with different levels of experience and capacity, there is no single entry point that fits all. Instead, the model provides flexible pathways. The following categories correspond to phased steps in the model and serve as a way to identify the user's Entry Point Assessment based on capacity, priorities, and existing practices:

- **"Foundational"** applies to those new to CARE, who should begin by grounding their work in recognition, context setting, and foundational principles (Phases 0–1).
- **"Building Momentum"** suits actors who already have some CARE-aligned practices in place and are ready to select relevant indicators and apply maturity ratings to assess progress (Phases 2–4).
- **"Strengthening Alignment"** is for actors with more established CARE-aligned practices, who can move toward applying measurement tools, refining processes, and innovating in partnership with Indigenous communities (Phases 5–6).
- **"Maintaining Commitment"** ensures CARE alignment is not a one-off task but an ongoing cycle. Regular review, reflection, and adaptation with Indigenous partners sustain progress and keep practices responsive to evolving community needs (Phase 7).

Note: Community engagement is assumed throughout all phases. However, it is critical to recognize that Indigenous communities vary widely in capacity, priorities, and interest in engaging with external actors. These phases assume a baseline of mutual willingness and should always be adapted to the specific relationship, context, and capacity of both parties. Some communities may not wish to engage with certain external actors at all, and this must be respected.

Phase 0 — Recognition and Context Setting

Entry Point: Foundational

Before beginning, your organization should reflect on its positionality — your relationship to the data and your role in its use — the purpose of your work, and the Indigenous community or communities to whom the data belongs. This phase ensures the entire process is grounded in respect, informed consent, and alignment with community priorities.

Core activities

- Clarify your organization's positionality: your relationship to the data and your role in its use.
- Define the purpose and intended outcomes of your organization's data work.
- Identify the rightful data stewards and governance authorities, including reviewing any existing frameworks, MOUs, government-to-government agreements, or protocols that may apply.
- Recognize existing protocols, histories, and potential harms or benefits in relation to the data.
- Document the scope of your engagement with Indigenous communities and data, including any limits or assumptions.

Proposed Outputs

- Written statement of organizational positionality in relation to Indigenous data.
- List of recognized data stewards and governance authorities.
- Summary of known protocols, histories, and potential risks/benefits of your organization's data practices.
- Draft or formal agreement on scope of engagement.

Decision guidance

- Always seek clarity on ownership and governance before moving forward.
- Assume that Indigenous communities have protocols governing their data even if those protocols are not yet visible to you. Proceed with humility and respect.
- Engage community representatives early to validate context setting — and be prepared to compensate community members fairly for their time and expertise.

Phase 1 — Establish Foundational Principles and Values

Entry Point: Foundational

Ground the process in shared values by aligning with the CARE Principles: Collective Benefit, Authority to Control, Responsibility, and Ethics.

Core activities

- Review the CARE Principles and interpret them in your specific organizational context. Consider using available resources such as training materials, webinars, and publications from GIDA, ENRICH, USIDSN, and related networks.
- Investigate the local context: what principles, models, or frameworks exist in your country or local community? Ensure you are not duplicating or bypassing existing Indigenous frameworks.
- Facilitate dialogue with Indigenous community partners to establish shared values — ensuring you approach this with resources and compensation, not just requests for community labor.
- Identify tensions or gaps between current practices and CARE principles.
- Agree on values that will guide decision-making and accountability moving forward.

Proposed Outputs

- Shared principles statement or values charter.
- Documented alignment of organizational goals with CARE Principles and applicable local frameworks.
- A timeline of meaningful engagements with Indigenous stakeholders to foster continued partnership and ensure communities remain apprised of developments concerning their data.

Decision guidance

- Revisit principles and values whenever conflicts or trade-offs arise.
- Use agreed values to guide all subsequent steps.
- Values and principles should be affirmed by Indigenous partners, not assumed.

Phase 2 — Choose Relevant Indicators

Entry Point: Building Momentum

Translate principles into practice by selecting indicators that reflect your role, project, or organizational context. This is also the phase where you "choose your path" — selecting either the Actor Role pathway or the Core Principle pathway as described in Section 4b.

Core activities

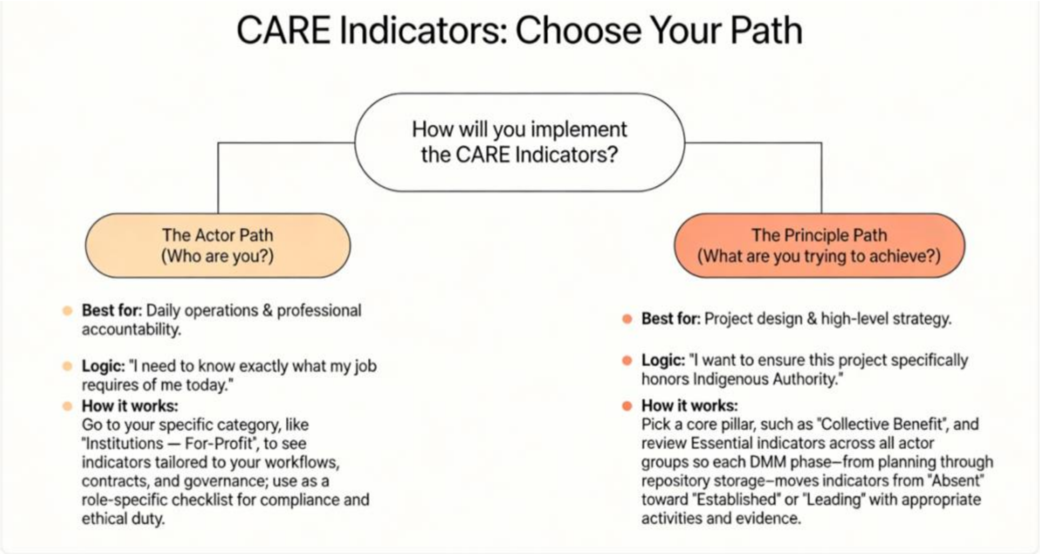
- Consult the CARE indicators framework to understand available indicators and sub-indicators.
- Ideally, begin by asking Indigenous community partners what indicators and priorities they find most relevant — communities often start from a different set of concerns than external practitioners.
- Identify which indicators are most relevant to your work and role.
- Break indicators down into sub-indicators and actor-specific criteria.
- Discuss indicator relevance with Indigenous partners and revise accordingly.

Proposed Outputs

- List of selected indicators and sub-indicators.
- Rationale for indicator selection.
- Agreement with community on indicator applicability.

Decision guidance

- Choose indicators that reflect community priorities, not just institutional needs.
- Avoid selecting indicators you cannot realistically measure or influence.
- Document reasoning for transparency and accountability.



The Actor Path (Who are you?)

- **Best for:** Daily operations & professional accountability.
- **Logic:** "I need to know exactly what my job requires of me today."
- **How it works:** Go to your specific category, like "Institutions — For-Profit", to see indicators tailored to your workflows, contracts, and governance; use as a role-specific checklist for compliance and ethical duty.

The Principle Path (What are you trying to achieve?)

- **Best for:** Project design & high-level strategy.
- **Logic:** "I want to ensure this project specifically honors Indigenous Authority."
- **How it works:** Pick a core pillar, such as "Collective Benefit", and review Essential indicators across all actor groups so each DMM phase–from planning through repository storage–moves indicators from "Absent" toward "Established" or "Leading" with appropriate activities and evidence.

Phase 3 — Assess Capacity, Feasibility & Immediate Priorities

Entry Point: Building Momentum

Before applying maturity ratings, evaluate which priorities are realistic to accomplish now, and which gaps must be addressed immediately. This step aligns your priorities with actual organizational capacity and with the readiness and priorities of your Indigenous community partners. It identifies urgent risks and quick wins, and produces a community-validated starting point.

Core activities

- Map current capacity for each selected indicator — including staffing and time, skills, budget, technical infrastructure, governance authority, and partner capacity. Compile any outstanding questions that may require revisiting Phases 0 or 1.
- Inventory available resources (MOUs, protocols, data access, metadata, tools, training, funding).
- For each priority indicator, assess feasibility across: required effort, estimated cost, timeline, dependencies, consent and approval needs, and ethical concerns or potential for harm.
- Flag urgent ethical concerns — such as unresolved consent issues, data breaches, or legal risks — and identify how and when these will be addressed in your action plan.
- Identify quick wins (low effort, high impact) and capacity-building actions that unlock larger changes.
- Co-determine readiness and the recommended starting point with Indigenous data stewards and governance authorities.

Proposed Outputs

- Capacity map and resource inventory.
- Feasibility matrix (priority × effort × impact × ethical risk).
- Prioritized implementation roadmap (immediate: 0–3 months; near-term: 3–12 months; longer term), including review dates.
- Recommended first action(s) with rationale and identified resource gaps.

- Short risk register for urgent ethical items.

Decision guidance

- Address anything that is causing ongoing harm first.
- Prioritize high-impact, low-effort items that build trust and enable downstream work.
- If a capacity or capability gap is a common dependency, prioritize building it early.
- Always confirm the chosen starting point with community partners and adjust based on their input.

Phase 4 — Apply the Maturity Ratings

Entry Point: Building Momentum

Use the Maturity Rating scale to establish a baseline for each selected indicator and identify areas for growth. This evaluation tool should be reviewed with Indigenous rights-holders for additional modifications or approval before finalization.

Core activities

- Rate each CARE indicator using the scale: 0 = Absent, 1 = Emerging, 2 = Established, 3 = Leading.
- Document the rationale for each rating.
- Cross-check ratings with evidence and partner feedback.
- Highlight patterns across indicators (strengths vs. gaps).

Proposed Outputs

- Completed maturity ratings table.
- Documentation of rating rationales.
- Initial analysis of strengths and areas requiring development.

Decision guidance

- Be conservative — do not overstate maturity.
- Ratings should be co-validated with Indigenous partners.
- Use the scale for learning and improvement, not judgment.

Phase 5 — Select Measurement Approaches

Entry Point: Strengthening Alignment

Identify how progress will be measured, prioritizing community-defined methods. Revisit capacity and timeline from Phase 3 to calibrate your co-created measurement plan.

Core activities

- Review available measurement approaches: community metrics, quantitative/qualitative measures, process/outcome metrics, evidence documentation (see Section 7 for detailed descriptions and examples).
- Co-develop measurement tools with Indigenous partners.
- Choose approaches suited to organizational capacity and community context.
- Balance rigor with feasibility.

Proposed Outputs

- Co-developed tools or instruments.
- Agreement on roles in data collection and analysis.

Decision guidance

- Prioritize community-defined metrics and participatory methods.
- Avoid imposing measurement tools without co-design.
- Ensure methods are feasible given current capacity.

Phase 6 — Documentation of Status and Progress

Entry Point: Strengthening Alignment

Gather supporting documentation to validate ratings and demonstrate accountability. Build from resources compiled in Phase 3 and add any additional or new evidence for each indicator.

Core activities

- Collate evidence (e.g., MOUs, protocols, ethics reviews, metadata labels, interview transcripts).
- Ensure the documentation process respects Indigenous community governance protocols, and progress remains transparent and accessible to community partners.

Proposed Outputs

- Annual progress report documenting areas of growth and actions taken in alignment with CARE Principles — shared and co-created with Indigenous rights-holders, and ideally incorporated into organizational annual reporting.
- Documentation index or catalog to create a repository of relevant progress for future staff and institutional memory.
- Evidence portfolio supporting maturity ratings (co-verified with community partners).

Decision guidance

- Evidence must be accessible to Indigenous partners.
- Respect Indigenous community confidentiality and governance rules — not simply organizational rules.
- Avoid over-documentation that burdens communities.

Phase 7 — Review, Reflect & Improve

Entry Point: Maintaining Commitment

Treat the process as iterative, building capacity and alignment over time. CARE alignment is an ongoing cycle, not a one-time task.

Core activities

- Schedule regular review intervals with community partners.
- Reflect on progress, barriers, and lessons learned.
- Update priorities, ratings, and measurement plans.
- Adapt practices to evolving community needs, as well as changes in organizational structure and the broader technological and political context.

Proposed Outputs

- Review reports or meeting notes.
- Updated priorities, ratings, and measurement plans.
- Revised roadmap with next steps.

Decision guidance

- Reflection must be collective, not individual.
- Be open to adapting when the community needs to shift direction.
- Treat review as both accountability and relationship-building.

6. Maturity Ratings

After identifying an entry point, the next step is to evaluate the extent to which CARE Principles are being implemented. The maturity rating scale provides a structured means of assessing progress against each indicator, ranging from initial absence to advanced, community-led practice. These ratings establish a shared reference point for identifying current status, highlighting areas of strength, and revealing gaps requiring further development. The scale is intended as a tool for learning and improvement rather than judgment, supporting accountability and continuous alignment with Indigenous priorities and governance.

Rating	Label	Description
0	Absent	No consideration or documentation of Indigenous provenance, rights, or authority.
1	Emerging	Clear documentation practices exist; partially implemented, largely organization-led.
2	Established	Processes fully implemented; Clear engagement with Indigenous partners; routinely applied.
3	Leading	Co-development, Community-controlled innovation models are driving outcomes.

The framework is guided by principles of flexibility and accountability, recognizing that indicators vary in weight and interconnection. Progress in one area can reinforce others, and a holistic perspective supports comprehensive implementation. Key considerations:

- Not all CARE areas or indicators carry equal weight. Each CARE Principle may have a different number of indicators, and the distribution of Essential, Important, and Useful priorities can vary across principles, across Indigenous community contexts, and across actor types. This can introduce bias if results are aggregated without accounting for these differences.
- Priorities may shift based on context. As outlined in the Priorities section of the indicators framework, indicators may be upgraded or downgraded for different actors depending on resources, roles, and maturity levels.
- CARE-aligned practices will vary across communities. Requirements, expectations, and culturally grounded protocols differ, meaning evaluation must adapt in dialogue with the communities whose data is at stake.
- Modifying or removing indicators has consequences. Striking an indicator or lowering its priority will impact comparability of results across actors and contexts. These decisions should always center community-defined metrics.

7. Measurement Tools

The CARE DMM provides diverse tools to reflect various ways progress is measured and demonstrated. Each tool serves a distinct purpose, providing a comprehensive picture of CARE implementation when used together. Tools and measurement approaches should be selected collaboratively with Indigenous community partners, beginning in Phases 0–1 and revisited throughout the implementation cycle.

- **Community Metrics**: These tools focus on alignment with community-defined priorities and adherence to local or national protocols. Examples include the extent to which projects follow Indigenous governance protocols (such as those articulated by Te Mana Raraunga, OCAP®, or local community agreements), achieve outcomes prioritized by the community, or respond to community-identified needs.
- **Quantitative Metrics**: Quantitative tools measure tangible aspects of practice and documentation. Examples include the percentage of datasets annotated with Indigenous provenance metadata, the number of MOUs or agreements signed with Indigenous communities, and the proportion of projects applying co-developed procedures.
- **Qualitative Metrics**: Qualitative tools capture nuanced perspectives that cannot be represented numerically. These include narrative self-assessments, case studies, reflections from staff and community members, and descriptions of how principles are applied in context.
- **Process Metrics**: Process tools assess whether the systems, policies, and structures necessary for CARE-aligned practices are in place and functioning. Examples include evidence of documented procedures, participatory governance processes, and ongoing training or capacity-building activities.
- **Outcome Metrics**: Outcome tools measure the tangible results of CARE-aligned practices. These may include improved community capacity for data management, adoption of community-led innovations, or demonstrable benefits to Indigenous communities from data projects.

Tracking and timelines are essential for ensuring that CARE implementation is not a one-time exercise but an ongoing process of improvement. Progress should be monitored over time with specific dates and frequencies for review, and clear milestones and mechanisms that make change visible and actionable. This can include:

- Visualizations such as dashboards or charts that summarize maturity ratings and highlight trends;
- Self-assessment guides that allow teams to reflect on their own progress against established criteria; and
- Feedback cycles that create structured opportunities for communities to provide input and shape adaptations.

As noted in the documentation section below, these practices ensure that progress is recorded transparently, validated with community partners, and used as a foundation for accountability and continuous learning.

8. Documentation

Documentation is an essential part of the CARE DMM process. It acts as a self-audit, creating a transparent record of what actions have been taken, what agreements are in place, and how CARE Principles have been applied in practice. Without clear documentation, it is difficult to accurately evaluate progress, identify areas for improvement, or demonstrate accountability to Indigenous communities and other data actors.

Evidence gathering should be intentional, ongoing, and co-designed with the communities whose data is being used. This may include:

- **Formal Agreements and Governance Documents**: MOUs, community protocols, data-sharing agreements, and ethics review reports.
- **Platform Metadata**: Use of Traditional Knowledge (TK) Labels, notices of Indigenous provenance, and data access restrictions.
- **Feedback and Reflection Tools**: Interviews, surveys, or self-assessment forms documenting both process and outcomes.
- **Independent Review**: Third-party audits, peer review, or community-led evaluations.

By systematically documenting both processes and outcomes, data actors can better track their maturity ratings over time, provide evidence for their measurement scores, and ensure that future decisions are informed by past actions. Most importantly, thorough documentation strengthens trust and accountability between data actors and Indigenous communities.

9. Sustainability and Future Maintenance

Sustainability requires embedding CARE-aligned practices into the everyday culture, systems, and governance structures of organizations so that they endure beyond individual projects or staff. Many Indigenous data governance systems were designed to sustain life and well-being across generations — this long-view orientation is precisely what external institutions must learn from and aspire to.

This means committing to regular reviews that reassess priorities, indicators, and outcomes in response to evolving community needs; investing in capacity-building to strengthen the skills, infrastructure, and resources necessary to uphold CARE Principles; and maintaining accountability mechanisms that ensure transparency, clarify responsibilities, and document follow-up actions. As outlined in the phased framework, these reviews should function as an ongoing internal audit, offering a way to return to earlier steps, refine practices, and re-enter cycles of self-evaluation.

Sustainability is not a one-time "check-the-box" exercise, but a living process of continuous alignment, relationship-building, and improvement. By following these steps, the CARE DMM becomes not just a static framework but a living tool for building respectful, equitable, and community-centered approaches to Indigenous data governance.

Conclusion

The CARE DMM serves as a bridge between high-level ethical principles and the practical, day-to-day realities of data stewardship. By design, the DMM is not a rigid or punitive checklist, but a flexible and iterative framework that meets data actors wherever they are on their journey. It acknowledges that growth toward Indigenous Data Sovereignty is rarely linear; instead, it provides the depth and guidance necessary to navigate complex data landscapes while remaining firmly anchored in community-defined priorities.

By utilizing the staged indicators, maturity ratings, and diverse measurement tools outlined in this document, actors can move beyond mere compliance toward meaningful, relational data governance. Whether an organization is just beginning to recognize Indigenous authority or is already innovating in community-led practices, the DMM offers a clear roadmap for continuous improvement. Ultimately, this tool is an invitation to build a more equitable data future — one where accountability, collective benefit, and respect for Indigenous sovereignty are the standard for all data practice.

Appendix: Hypothetical Profiles

The following hypothetical profiles illustrate how diverse data actors — ranging from individual researchers to large-scale funding agencies — might navigate the CARE DMM. By applying the model's self-assessment logic, these actors identify their specific entry points, move through the appropriate implementation phases, and select the measurement tools necessary to validate their maturity ratings.

Hypothetical Profile 1: The University Researcher (Individual Actor)

Context: An ecologist who has collected soil samples on Indigenous lands for years without formal data-sharing agreements or community consultation.

Entry Point Assessment	Phased Roadmap	Maturity Ratings	Measurement Tools
"Foundational" — The researcher is new to the CARE framework and currently lacks foundational community relationships.	Phase 0 (Recognition and Context Setting). Focus is placed on identifying rightful data stewards and reflecting on the researcher's positionality.	All CARE areas: 0 — Absent. There is currently no documentation of Indigenous provenance or authority within the project's data lifecycle.	Qualitative Metrics. Initial progress is documented through a written statement of positionality and a narrative reflection on potential research harms.

Hypothetical Profile 2: The Regional Health Repository (Institutional Actor)

Context: A non-profit repository that holds health records with basic MOUs in place, but Indigenous communities have no active role in the repository's governance or decision-making.

Entry Point Assessment	Phased Roadmap	Maturity Ratings	Measurement Tools
"Building Momentum" — The institution has some existing CARE-aligned documentation but needs to move toward active engagement.	Phase 3 (Assess Capacity & Priorities). Focus is on triaging "quick wins," such as formalizing an Indigenous advisory seat on the governance board.	All CARE areas: 1 — Emerging. Agreements exist (MOUs), but practice is only partially implemented and remains institution-led rather than community-driven.	Process Metrics. Progress is tracked by documenting the establishment of new participatory governance procedures and official board meeting minutes.

Hypothetical Profile 3: The National Science Funder (Funding Actor)

Context: A federal agency that requires all grant recipients to align with CARE, having co-developed these policy requirements with a National Indigenous Data Network.

Entry Point Assessment	Phased Roadmap	Maturity Ratings	Measurement Tools
"Strengthening Alignment" — The agency has established practices and is now	Phase 5 (Select Measurement Approaches). Focus is on co-developing	Collective Benefit: 2, Authority to Control: 1, Responsibility: 2, Ethics: 2 — Established.	Quantitative Metrics. Success is measured by the percentage of funded projects that provide

implementing system-wide accountability and measurement.	evaluation instruments to track the performance of grant recipients.	Policies were co-developed with Indigenous partners and are routinely applied to all funding cycles.	verifiable evidence of community-validated data management plans.

Appendix: CARE Principles and UNESCO 2021 Recommendation on Open Science

This table illustrates how CARE's four principles align with and are reflected in UNESCO's 2021 Recommendation on Open Science, demonstrating how international policy frameworks can serve as vehicles for CARE implementation.

CARE Principle	**Meaning**	**UNESCO Implementation (2021 Recommendation on Open Science)**
Collective Benefit	Data and knowledge should benefit Indigenous communities and society as a whole.	UNESCO calls open science a "global public good" and stresses that knowledge should "belong to humanity in common." It emphasizes reducing inequalities and ensuring that "the benefits of open science are shared and reciprocal, and do not involve unfair and/or inequitable extraction of data and knowledge."
Authority to Control	Indigenous peoples have the right to govern data about their knowledge, lands, and resources.	UNESCO highlights "the rights of indigenous peoples and local communities to govern and make decisions on the custodianship, ownership and administration of data on traditional knowledge and on their lands and resources."
Responsibility	Researchers must act responsibly, be accountable, and respect community values.	Open science guiding principles include "responsibility, respect and accountability" and warn against "unfair and/or inequitable extraction of profit from publicly funded scientific activities." It stresses vigilance for "possible social and ecological consequences of research activities."
Ethics	Data use must protect Indigenous rights, cultures, and sacred knowledge.	UNESCO states that openness is not absolute: restrictions are justified to protect human rights, privacy, and sacred/secret Indigenous knowledge; promotes ethical standards in research and data stewardship. "Access restrictions... are only justifiable on the basis of the protection of

		human rights... sacred and secret indigenous knowledge."

Appendix: CARE Directs Us Home

GIDA COMMUNIQUÉ: CARE Directs Us Home

CANADA

- First Nations OCAP® Principles
- The First Nations Information Governance Centre Online Library
- First Nations Data Governance Strategy
- National Inuit Strategy on Research

Updated Inuit and Métis resources coming soon

UNITED STATES

- US Indigenous Data Governance Principles
- Resolution of the Tribal Council of the Cheyenne River Sioux Tribe regarding Support for Tribal Data Sovereignty and Research Governance Plan (forthcoming)
- Practicing Pikyav: Policy for Collaborative Projects and Research Initiatives with the Karuk Tribe

CARE Directs Us Home: Local Resources

INTERNATIONAL

- CARE Principles for Indigenous Data Governance
- Indigenous Peoples' Rights in Data
- CARE Data Maturity Model
- Maiam nayri Wingara (2025), Global Indigenous Data Sovereignty Conference Communiqué, Canberra, Australia (forthcoming)

SÁPMI
(Finland, Sweden, & Norway)

- Sámi Ownership and Data Access (SODA) Principles
- Ethical Guidelines for Research Involving the Sámi in Finland
- Ethical Guidelines for Sámi Health Research (Norway)
- Proposal for Ethical Guidelines for Sámi Health Research and Research on Sámi Human Biological Material (Norway)

ASIA

- Asian Framework on Indigenous Knowledge and Data Sovereignty

AUSTRALIA

- Maiam nayri Wingara Principles
- Taking Control of our Data: Discussion Paper
- AIATSIS Code of Ethics
- Australian Framework for the Governance of Indigenous Data

AOTEAROA NEW ZEALAND

- Te Mana Raraunga Māori Data Sovereignty Principles
- Māori Data Governance Model
- Kaitiakitanga License
- Pacific Data Sovereignty Principles

***For a regularly updated list of Local Resources for Indigenous Data Governance, please see** The Collaboratory for Indigenous Data Governance's CARE Data Maturity Model.*

References

Carroll, S.R., Garba, I., Figueroa-Rodríguez, O.L., Holbrook, J., Lovett, R., Materechera, S., Parsons, M., Raseroka, K., Rodriguez-Lonebear, D., Rowe, R., Sara, R., Walker, J.D., Anderson, J., and Hudson, M. (2020). The CARE Principles for Indigenous Data Governance. Data Science Journal, 19(1), p.43.

Carroll, S.R., Hudson, M., Chapman, J., Doerfler, J., Peltier, S., et al. (2021). Operationalizing the CARE and FAIR Principles for Indigenous Data Futures. Scientific Data, 8, 108. https://www.nature.com/articles/s41597-021-00892-0

FNIGC (First Nations Information Governance Centre). (n.d.). OCAP® Principles. https://fnigc.ca/ocap-training/

GIDA (Global Indigenous Data Alliance). (2024). CARE Directs Us Home. https://fnigc.ca/news/gida-care-directs-us-home-prioritizing-indigenous-peoples-community-standards/

IWGIA (International Work Group for Indigenous Affairs). (2020). Indigenous World 2020.

Kukutai, T. and Cormack, D. (2020). Pushing Space for Indigenous Data Sovereignty in Aotearoa New Zealand. In T. Davies et al. (Eds.), The State of Open Data. African Minds. https://www.taylorfrancis.com/chapters/oa-edit/10.4324/9780429273957-2/pushing-space-tahu-kukutai-donna-cormack

Lightfoot, S. (2016). Global Indigenous Politics: A Subtle Revolution. Routledge.

Mons, B., Schultes, E., Liu, F. and Jacobsen, A. (2019). The FAIR principles: first generation implementation choices and challenges. Data Intelligence, 2, pp. 1–9.

PLOS (2023). Indigenous data sovereignty in research. https://www.nature.com/articles/d41586-024-03640-7

Smith, L.T. (1999). Decolonizing Methodologies: Research and Indigenous Peoples. Zed Books.

UNESCO. (2021). UNESCO Recommendation on Open Science. UNESCO.

United Nations. (2007). United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). United Nations.

Acknowledgments

We collectively acknowledge the many individuals, communities, and organizations whose knowledge, guidance, and ongoing efforts have shaped the development of the CARE DMM and associated guidelines. This work builds on the leadership and scholarship of Indigenous Peoples and communities globally who have long advanced principles and practice for Indigenous Data Sovereignty. We are especially grateful to our colleagues at Te Mana Raraunga, Te Kāhui Raraunga, the US Indigenous Data Sovereignty Network, Maiam nayri Wingara, the Global Indigenous Data Alliance (GIDA), the Indigenous Data Law Lab at NYU, the First Nations Information Governance Centre, and GIDA-Sápmi for engagement in the co-creation of this tool and its guidelines. We thank Per Axelsson, Lara Greaves, Jacquelyn Córdova, and Mari Hulbutta for their valuable review and feedback of the draft guidelines. We also recognize the contributions of the hundreds of data practitioners who participated in our CARE DMM user-group webinars and workshops to provide feedback that was fundamental in the design this work. Finally, we recognize the institutional, programmatic, and funding support that has enabled this work including the Henry Luce Foundation and the National Science Foundation (NSF Award # 2412372), as well as the often-unseen labor that sustains the work of internal and external systems transformation for the governance of Indigenous data.