



The Canadian Food Inspection Agency's Open Science Action Plan 2021- 2026



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Message from the President

I am pleased to present the Canadian Food Inspection Agency's (CFIA's) first Open Science Action Plan (OSAP). It is an evergreen approach to how the CFIA will achieve the overall objective of [Open Science](#). More than ever, it is clear that an inclusive, collaborative and open approach is crucial for success as a science-based regulator. As a federal agency, part of our job is to serve Canadians and provide access, transparency, and openness to all the great work that we do at the CFIA.

In February 2020, Canada's Chief Science Advisor (CSA) published the Federal Roadmap for Open Science. The Roadmap provides overarching principles and recommendations on making federal science open and available to all Canadians. The CFIA continues to support Open Science initiatives, and I am happy to report that we have made significant progress on several of the Roadmap recommendations.

I am excited to announce that CFIA has designated a Chief Scientific Data Officer (CSDO). The CSDO will continue to enhance coordination between Open Data, Open Science, and Science Data Management, as well as continue CFIA's dataset publishing momentum. Also in line with Roadmap recommendations, the CFIA launched an internal scientific community consultation on Open Science at CFIA. This consultation allowed us to gather feedback on level of awareness, potential challenges, and opportunities on Open Science activities at the CFIA. The consultation results have been instrumental in the creation of this action plan.

The OSAP describes how CFIA will achieve Open Science initiatives while continuing to lead as a science-based regulator. Achieving Open Science will certainly have its challenges. However, I am fully confident that CFIA can put into place measures that support CFIA employees to share their scientific work openly, transparently, and more easily, with Canadians. As we move forward together with Open Science at the CFIA, overcoming these challenges will make us stronger as an organization and will continue to benefit all Canadians.

Siddika Mithani, Ph.D.

President, Canadian Food Inspection Agency

Background

As a commitment under the Open Government Action Plan (2018-2020), Canada's Chief Science Advisor (CSA) published the federal [Roadmap for Open Science](#). The Roadmap describes five overarching principles and ten recommendations for making federal science open and available to all Canadians. While several of the recommendations will be developed and implemented by the CSA's office, the remainder will require further actions by science based departments and agencies - including the Canadian Food Inspection Agency (CFIA). A summary table of the Roadmap recommendations and CFIA's efforts to address these recommendations can be found in Appendix 1. A key recommendation of the Roadmap is for departments and agencies to develop action plans for Open Science.

CFIA's first Open Science Action Plan (OSAP) provides the details of how it will achieve the overall objective of Open Science. The CFIA's OSAP will take a phased, evergreen approach, covering the period of 2021 to 2026.

The Government of Canada has committed to increasing the accessibility of federal science initiatives through Open Science. Open Science involves making scientific information available to all Canadians, and it ensures that CFIA is open, transparent and accountable for their scientific work. CFIA's Open Science efforts demonstrate to Canadians that we value their right to access the scientific work underway. While Open Science initiatives aim to ensure science information is available to all, there are other benefits to Open Science, including:

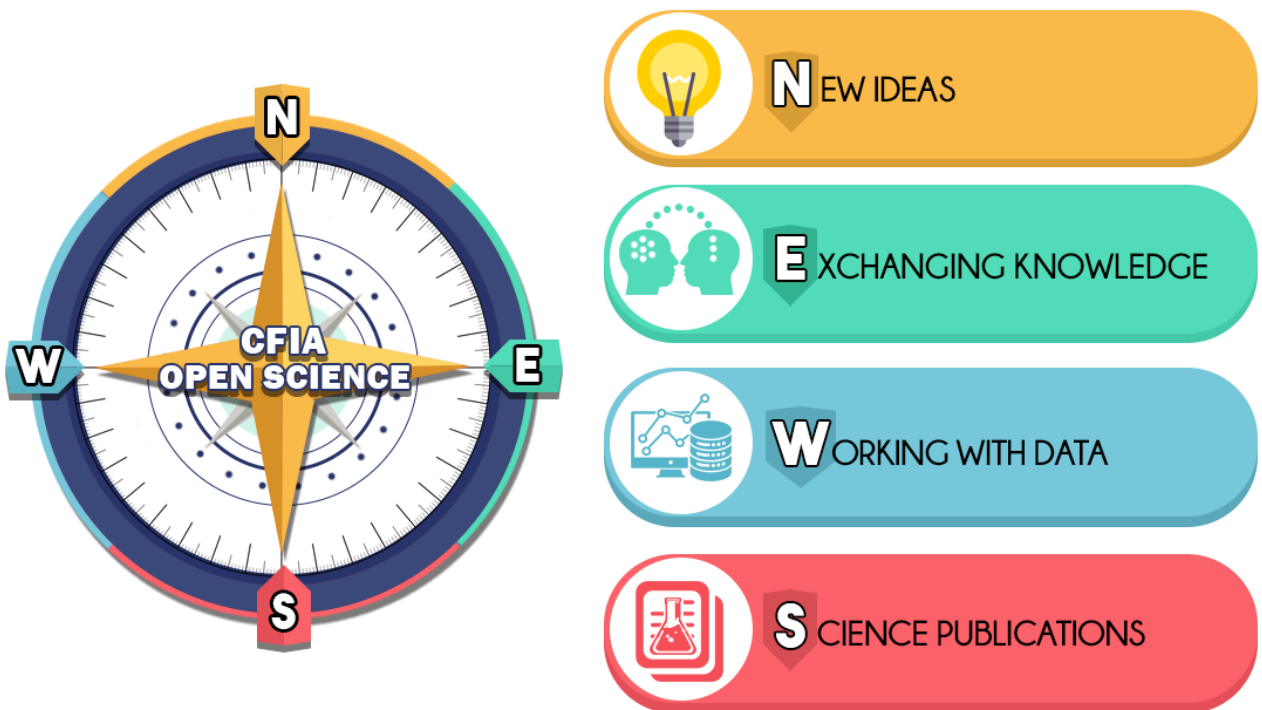
- ensuring accountability for others;
- increasing reproducibility of scientific results;
- creating an opportunity for Canadians to engage and learn about scientific work;
- reducing duplication of scientific work;
- creating opportunities to build on previously validated research, possibly accelerating new scientific discoveries;
- leveraging diversity and inclusion to benefit from different perspectives;
- accelerating knowledge sharing and reuse of scientific information; and,
- building synergies worldwide in relation to Open Science movements in other places.

As a science-based regulator, CFIA continues to be dedicated to safeguarding food, animals and plants, and enhancing the wellbeing of Canada's people, environment and economy. We recognize the tremendous value of scientific work, the value of the people who do the work, and most importantly, the value of the people for whom the work is done. More than ever before, Canadians expect information that is supported by sound science and they are interested in learning about current research and science-based initiatives taking place across the federal government.

CFIA's OSAP specifically addresses Roadmap *Recommendation #3* in that departments and agencies should develop action plans for Open Science that include plans for a common, phased approach towards making federal science open (taking into account *Recommendations 4, 5 and 7*) and readily and easily available to Canadians. Taking into consideration feedback from CFIA'S Open Science internal consultation, CFIA has developed this OSAP to address the Roadmap recommendations and the priorities identified through the consultation process. This OSAP will set the direction for how the CFIA will achieve, promote, and use Open Science.

The Open Science Action Plan: A Compass

The CFIA's first Open Science Action Plan (OSAP) will leverage the federal [Inclusive Open Science Life Cycle](#) presented to the federal Open Science Director General Council in October 2019. The Inclusive Open Science Lifecycle inspired the creation of the CFIA's Open Science Compass, shown below, which provides the directions that the CFIA will use to develop and implement Open Science.

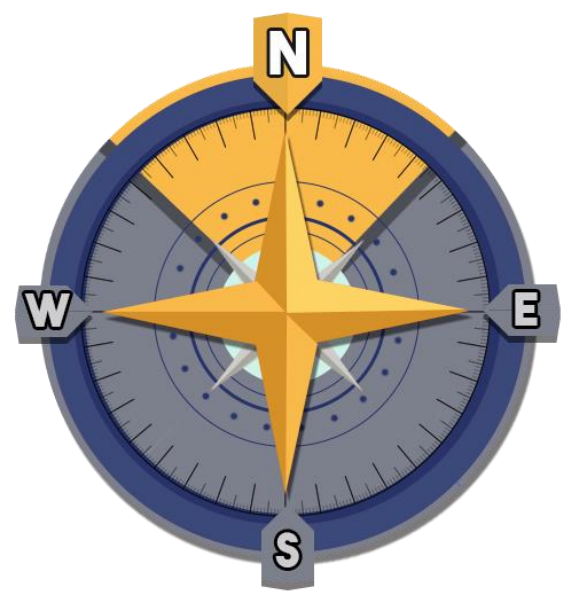


The CFIA's OSAP and Compass will support openness, transparency, and accountability while allowing the organization to continue to excel as a science-based regulator. As the CFIA moves forward in achieving the objective of Open Science, the CFIA will strengthen its relationship with stakeholders, collaborators, as well as Canadians.

The CFIA's OSAP is intended for and will impact all CFIA employees. Many active and passive stakeholders will have a role in implementing and supporting this evergreen Action Plan. As federal Open Science recommendations and priorities evolve, the OSAP will be reviewed and refreshed as necessary.

The following sections describe each Open Science Direction, the CFIA's Open Science priorities, and the planned actions to move Open Science forward at the CFIA.

DIRECTION: NEW IDEAS



The New Ideas direction involves the creative process of developing and communicating new thoughts and ideas. It touches on all stages of an “idea”, from innovation to development to implementation of the idea itself. New Ideas can include [open proposals](#), [community engagement](#), and [innovation challenges](#).

In relation to the New Ideas priorities, the CFIA will develop clear and simple processes to improve how employees share their ideas, data and information more openly with others. New Ideas actions will address confidentiality and privacy concerns related to Open by Design and Open by Default principles. The CFIA will engage senior management to support and promote communication of science and scientific outreach activities. Opportunities for CFIA employees to learn about Open Science practices will be established to improve how their ideas are communicated. The CFIA will apply the [FAIR*](#) principle, “as open as possible, as closed as necessary”, to maximize Open Science benefits while minimizing risk.

The CFIA has identified the following New Ideas priorities and how we will address them below:

PRIORITIES	ACHIEVED THROUGH
<p>1. CFIA employees have senior management support for Open Science initiatives.</p>	<p>Establishing:</p> <ul style="list-style-type: none"> ➤ Governance that will ensure all-of-support for Open Science initiatives; and ➤ Collaborative relationships with existing CFIA groups that address open and transparent commitments.
<p>2. CFIA employees have access to tools and systems that allow them to achieve and implement Open Science initiatives for all stages of new ideas.</p>	<ul style="list-style-type: none"> ➤ Developing clear and simple processes that allow for sharing of data, methods, and proposals in an open forum when appropriate; and ➤ Adopting an Open by Design and Open by Default approach that allows employees to make their science open from the early stages of scientific work.

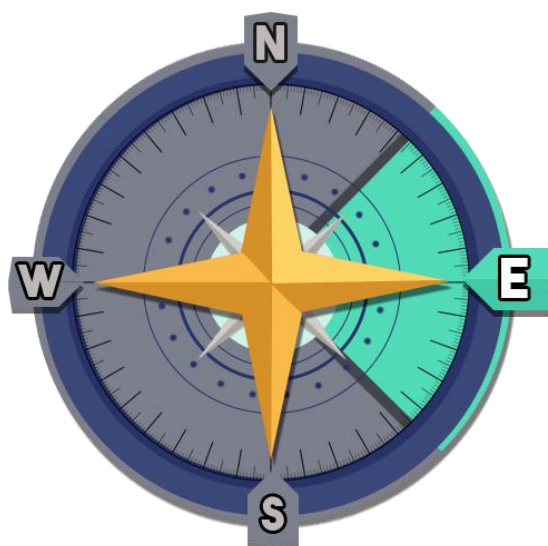
* Findable, Accessible, Interoperable, and Reusable

DIRECTION: EXCHANGING KNOWLEDGE

The Exchanging Knowledge Direction involves the process of relationship building with the intent of making a connection between scientific work, organizations, people, and governments to improve information exchange and inform policy change. Exchanging Knowledge can encompass [knowledge brokering](#), [knowledge transfer](#), and [knowledge communication](#).

In relation to Exchanging Knowledge, the CFIA will streamline internal processes for sharing and/or distributing scientific knowledge. Exchanging Knowledge actions will improve how the CFIA shares science through an increase in access to communication and technological training and through additional senior management support.

The CFIA has identified the following Exchanging Knowledge priorities and how we will address them below:

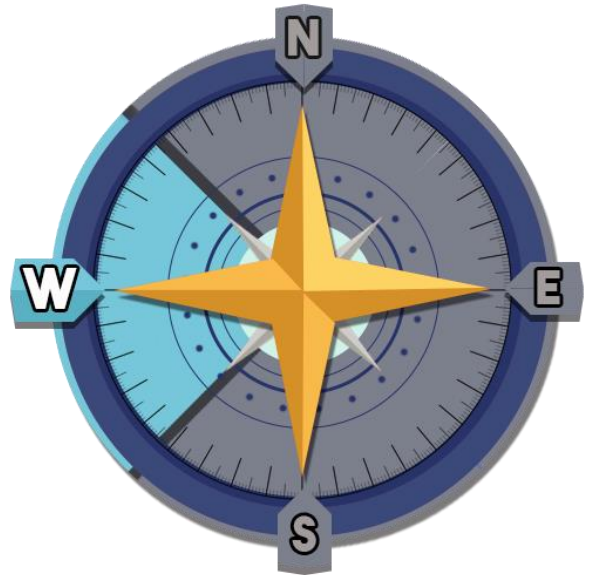


PRIORITIES	ACHIEVED THROUGH
<p>1. CFIA employees are provided with tools to effectively communicate their science activities.</p>	<p>Developing:</p> <ul style="list-style-type: none"> ➤ Clear and streamlined internal processes for sharing science with the public; and ➤ Communication vehicles promoting Open Science initiatives and learning opportunities.
<p>2. Explore new opportunities for the CFIA to engage with external experts and stakeholders to enhance scientific collaborations.</p>	<ul style="list-style-type: none"> ➤ Consulting with CFIA’s Legal Services to explore and address employee concerns regarding ownership of scientific work and privacy issues; and ➤ Developing and/ or leveraging networks with educational institutions (e.g., universities) to support open science knowledge exchange.

DIRECTION: WORKING WITH DATA

The Working With Data Direction involves the collection of information to help formulate answers or develop more questions for scientific work. It may encompass [open data](#), [open methods](#), [reproducible methods](#), and [citizen science](#).

In relation to Working with Data, the CFIA will develop clear, streamlined and standardized internal processes, enabling employees to share their scientific data and methods more openly. This direction aligns with the CFIA's Data Strategy and current activities that support Open Data publishing. The CFIA will develop guidance and processes to support the FAIR and [CARE*](#) data principles (where appropriate), while also addressing privacy and confidentiality concerns related to making scientific data open.



The CFIA has identified the following Working with Data priorities and how we will address them below:

PRIORITIES	ACHIEVED THROUGH
<p>1. CFIA employees are provided clear and concise processes to facilitate the sharing of scientific data.</p>	<ul style="list-style-type: none"> ➤ Clarifying the scope and magnitude of scientific data created by CFIA employees; ➤ Developing clear and simple processes that allow for improved sharing of scientific data; and ➤ Improving communication tools, including digital-first tools, to promote the value and importance of open data, open methods, reproducible methods and citizen science.
<p>2. CFIA employees are confident that they can share their scientific data in a manner that ensures privacy and confidentiality concerns are respected.</p>	<ul style="list-style-type: none"> ➤ Engaging with CFIA's Legal Services and Access to Information and Privacy Office experts to offer solutions for confidentiality and privacy concerns identified by CFIA employees.

* *Collective Benefit, Authority to Control, Responsibility, Ethics*

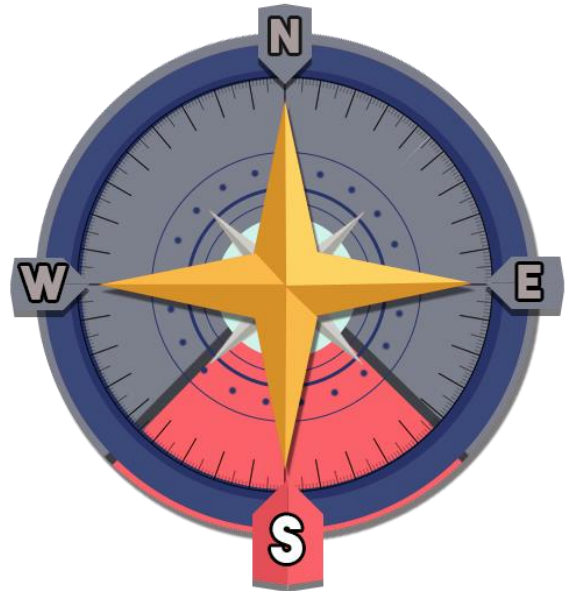
DIRECTION:

SCIENCE PUBLICATIONS

The Science Publications Direction is essential for scientists to communicate their ideas, questions, and findings. It can encompass [preprints](#), [open access](#), and [open innovation](#).

In relation to Science Publications, the CFIA will explore options including associated costs associated with open access publishing. Science Publications provide an opportunity to explore benefits associated with using preprints and opportunities for open innovation.

The CFIA has identified the following Science Publications priorities and how we will address them below:



PRIORITIES	ACHIEVED THROUGH
1. Maximize open access for all scientific publications authored by CFIA employees.	<ul style="list-style-type: none">➤ Clarifying the scope and magnitude of all science publications authored by CFIA employees;➤ Streamlining associated internal processes related to financial pressures and policy alignment (e.g., Scientific Integrity, Scientific Publication Policy); and➤ Exploring use of preprint opportunities at the CFIA.
2. Address concerns associated with publication fees for scientific journal open access.	<ul style="list-style-type: none">➤ Determining and implementing a consistent approach to address open access fees where applicable.

Moving Forward

The CFIA's Open Science Action Plan (OSAP) solidifies its commitment to openness and transparency, the value of sound science and the importance of open science. The OSAP describes the CFIA's priorities in relation to each Open Science Direction and indicates how each of them will be addressed.

Implementing, monitoring, evaluating, and reporting results will be done with an Open Science Implementation Plan (OSIP). The OSIP will be used as a framework to monitor the progress of activities linked to the four directions outlined in this Action Plan. The OSIP will allow the CFIA to define measurable goals, objectives, timelines, dependencies, and accountabilities. The OSIP will also specify what reporting mechanism will be used. If changes occur in the Government of Canada's Open Science strategic direction, both plans will be reviewed to ensure that they remain relevant.

The CFIA is proud to implement measures that will support employees in sharing scientific work, openly, transparently, and more efficiently with the public. As we move forward with Open Science, we will continue to excel as a science-based regulator, become stronger and more resilient, and remain committed to transparency and accountability to all Canadians.

"Solutions to the great challenges we face require more knowledge, more science and more applications of technology. Opening up federal science will help pave a quicker path to discovery and at the same time ensure that the results of research paid for by Canadians is fully available to them"

– Dr. Mona Nemer, Chief Science Advisor of Canada

Appendix 1- List of the 10 Recommendations from the *Roadmap for Open Science* with a brief description of how the CFIA is addressing each Recommendation

<u>Roadmap for Open Science Recommendation</u>	<u>How the CFIA is addressing the Recommendation</u>
<p>1. Canada should adopt an Open Science approach to federally funded scientific and research outputs.</p>	<p>The CFIA recognizes the importance of taking such an approach, and continues to put measures into place to achieve Open Science at the CFIA.</p>
<p>2. Federal departments and agencies should conduct intradepartmental consultations with the science community before June 2020 to seek feedback on, and address in the action plan, the challenges and opportunities of Open Science. These should be led by the Department’s Open Science Champion(s), e.g., Departmental Science Advisor, Chief Science Officer, Assistant Deputy Minister and Vice President Science.</p>	<p>The CFIA launched an internal Open Science Consultation Survey in fall 2020. This outreach explored employee knowledge and use of Open Science, Open Data, challenges and awareness. The consultation highlighted that although the majority of CFIA employees were aware of Open Science, and that some staff noted they regularly “practice” Open Science, many identified the need for more support and guidance.</p>
<p>3. To achieve the overall objective of Open Science, and taking into consideration feedback from intradepartmental consultation (Recommendation 2), departments and agencies should develop action plans for Open Science by June 2021 (originally October 2020). This should include plans for a common, phased approach towards making federal science open (taking into account Recommendations 4, 5 and 7) and readily and easily available to Canadians.</p>	<p>To achieve the overall objective of Open Science - and taking into consideration feedback from CFIA’S Open Science Internal Consultation and new deadlines set by the CSA - the CFIA developed a draft Open Science Action Plan by the March 2021 deadline and will establish a final Action Plan by the end of June 2021. This Plan will address the priorities identified through the consultation process and sets the direction for how the CFIA will achieve, promote and use Open Science.</p>
<p>4. Federal departments and agencies should make federal science articles openly accessible by January 2022 and federal science publications openly accessible by January 2023, while respecting privacy, security, ethical considerations and appropriate intellectual property protection.</p>	<p>The CFIA is developing actions to address Recommendation 4, and they will be described in CFIA’s Open Science Implementation Plan.</p>

<p>5. Federal departments and agencies should develop strategies and tools to implement FAIR data principles to ensure interoperability of scientific and research data and metadata standards by January 2023, with a phased plan for full implementation by January 2025.</p>	<p>The CFIA is developing actions to address Recommendation 5, and they will be described in CFIA's Open Science Implementation Plan.</p>
<p>6. In order to enable the "Open by Design and by Default" model for scientific research outputs, the Chief Science Advisor will work with the federal science community and other government departments and agencies to develop by December 2020 a framework identifying criteria for when restricting access to federal scientific research outputs is warranted.</p>	<p>Various CFIA initiatives will focus on implementing an Open by Design and Open by Default approach, and they will be further explored in the implementation plan at a later date.</p>
<p>7. The Data Strategy Roadmap and the Open Science Action Plan should be aligned. For this to happen, consideration should be given to scientific and research data when developing and implementing data strategies in response to the 2018 Data Strategy Roadmap for the Federal Public Service. To facilitate that, deputy heads should designate a Chief Scientific Data Officer by January 2021 (originally June 2020). As relevant, this can be a stand-alone position or responsibility can be integrated into the scope of an existing position, e.g. Departmental Science Advisor, Assistant Deputy Minister and Vice President Science.</p>	<p>The CFIA designated a Chief Scientific Data Officer (CSDO) in January 2021. Having a CSDO will continue to enhance coordination between Open Data, Open Science and Science Data Management, as well as continue CFIA's dataset publishing momentum.</p>
<p>8. Successful and harmonized implementation of the Open Science Action Plans should be supported by a new high-level Open Science Steering Committee co-chaired by the Chief Science Advisor and either or both the Chief Information Officer of Canada and the President of Shared Services Canada.</p>	<p>The CFIA will adhere to the guidance and advice of the a new high-level Open Science Steering Committee in order to achieve successful and harmonized implementation of its Open Science Action Plan.</p>
<p>9. An Open Science strategy for federally funded research conducted outside of federal government agencies and departments should also be developed. The Chief Science Advisor could conduct such an exercise in partnership with the federal granting agencies (e.g. through the Canada Research Coordinating Committee), learned societies and provincial and territorial funders. These consultations should target scientific communities and their administrative leadership. The consultation should be completed by December 2021.</p>	<p>The CFIA will engage in consultations and participate where appropriate.</p>
<p>10. The Chief Science Advisor should monitor the dynamic international context and make recommendations to ensure that the Open Science strategy for federally supported intramural and extramural science continues to keep pace with international developments.</p>	<p>The CFIA will engage where appropriate.</p>

Glossary

CARE: The CARE Principles for Indigenous Data Governance are people and purpose-oriented, reflecting the crucial role of data in advancing Indigenous innovation and self-determination. These principles complement the existing FAIR principles encouraging open and other data movements to consider both people and purpose in their advocacy and pursuits. CARE is an acronym for “Collective Benefit, Authority to Control, Responsibility, Ethics”. (Source: Global Indigenous Data Alliance)

Citizen Science: Community science, public participation in research; People have a greater investment in the results and outcomes.

Community engagement: Reach out to community to involve them in planning process.

FAIR: The principle that scientific information that is open is also “Findable, Accessible, Interoperable and Reusable” (or “FAIR”) in order to maximize the benefit. FAIR data can assist computational systems to find, access, interoperate, and reuse data with no or minimal human intervention. By applying FAIR principles, researchers facilitate knowledge discovery and increase the chance of possible collaboration.

Federal science articles: Scholarly articles authored or co-authored by federal scientist(s) or researcher(s) in peer-reviewed academic journals.

Federal science publications: Scientific communications that scientists and researchers use to share their work. These include research or scientific reports, monographs, edited books, book chapters, conference proceedings, conference papers, conference contributions, posters, plain language summaries and technical scientific products. These publications have been validated by a peer-review process.

Innovation Challenges: Exploring new practices and method development, shareable equipment and IT infrastructures for open collaborative work; Opportunities for community engagement to address a problem.

Knowledge brokering: Facilitating the transfer of knowledge from where it is familiar to where it is missing; improving the innovative capabilities of organizations and their networks; Encourages scientists to engage in initiatives that will help people connect with them and make the science more discoverable.

Knowledge communication: How science is effectively and efficiently communicated to the public; Includes outreach activities and public seminars.

Knowledge exchange: Engaging researchers, policy developers and decision makers in the development and application of research knowledge in order to make timely, relevant, evidence-based decisions; Transferring knowledge to engaged users bridges a gap between research and real world application; Includes raising awareness of research findings and facilitating access to and use of research for a broader impact.

Knowledge transfer: Sharing or disseminating knowledge.

Open Access: Ensures publications are accessible to anyone that has access to the internet; Supports open innovation, embracing external collaboration.

Open Data: Some data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control; Data repositories provide a way for scientists to make their data and methods open, contributing to data being more useful; Opportunities for sharing data make it more powerful through collaboration.

Open Innovation: Promotes collaboration amongst people internally and externally of the organization; vastly different approach than the tradition silo and secrecy mindset.

Open Methods: Allow the general public, members of the scientific community and peers to view methods used for scientific work in an open forum, promoting open science and sharing of tools.

Open Proposals: May include sharing proposal applications online so others have an opportunity to offer input; Involves situation where stakeholders, potential end users and other community members can contribute to scientific work in progress; Encourages collaboration and decreases risk of duplication of work.

Open Science: The practice of making scientific inputs, outputs and processes freely available to all with minimal restrictions. Scientific research outputs include (i) peer- reviewed science articles and publications, (ii) scientific and research data and (iii) public contribution to and dialogue about science. Open Science is enabled by people, technology and infrastructure. It is practiced in full respect of privacy, security, ethical considerations and appropriate intellectual property protection.

(Source: Roadmap for Open Science)