Canadian Science Publishing and the Royal Society of Canada's Open Science Workshop 2019
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Executive summary

In Canada, a number of organizations and individuals are undertaking a diverse range of open science initiatives, which tend to be disparate and diffuse.

To bring cohesion to open science in Canada, Canadian Science Publishing, in collaboration with the Royal Society of Canada (RSC), convened a workshop, held during the RSC’s annual Celebration of Excellence, in Ottawa, Canada on November 24th, 2019.

The purpose of the workshop was to discuss Canada’s position in the open science landscape, share current Canadian open science initiatives, and identify opportunities for collaboration.

The workshop delegates included RSC Fellows and Members of the College of New Scholars as well as stakeholders with an interest in open science, including researchers, librarians, publishers, and funders.

A number of key themes and actions emerged:

• Canada has made progress on open science but there remains work to be done, setting the stage for Canada’s Open Science Roadmap to guide policies to support future open science initiatives
• Funding open science, particularly open access publishing, remains a challenge, as does moving away from the author-pays article processing charge model:
  • There is interest in exploring new initiatives such as transformative models to accelerate the transition to open access but experimentation is required to ensure that such models are sustainable
• There are existing funds in the scholarly research system but there is a need to better understand how to mobilize them; a catalytic investment as a nation is required to restructure how funding flows
• Worldwide, much of the discussion on open access business models has focused on large-scale for-profit publishers, with less emphasis on not-for-profit publishers, academic society publishers, and university presses, particularly for monographs as well as social sciences and humanities journals
• Protecting research integrity is essential; encouraging open data and other open science initiatives is key; research integrity should also be front-of-mind in the transition to open access
• Canada has not endorsed Plan S and current policies are not fully aligned in terms of compliance. There is a need to convene stakeholders to discuss this in detail and consider Canada’s position on open science in the global context

Overall, the workshop delivered on its goals of convening stakeholders to discuss Canada’s position in the open science landscape, share current open science initiatives that are taking place in Canada, and identify opportunities for collaboration. This workshop and report are just the beginning of the discussion and it is clear that there is a need to engage stakeholders in ongoing discussions to move open science in Canada forward.
Introduction

Open Science (OS) is the movement to make scientific research and research products freely accessible to everyone. Open science encourages open sharing of scholarly works, methods, data, code, software, and other research outputs.

Open Access (OA), a component of open science, makes scholarly research outputs, such as published journal articles, free to read, use, modify, and share. OA enables researchers to make their publications freely available to anyone, thereby enhancing the use, application and impact of the research. OA differs from the traditional model of scholarly publishing, which has been predominantly subscription-based. Subscription-based journals publish content that can be exclusively accessed by those who pay a subscription fee, usually paid by university libraries, research institutions, scholarly societies, or individuals. The predominant model to fund the cost of OA publishing is an author-paid Article Processing Charge (APC).

The drive towards OS has had a recent increase in momentum, spurred in large part by international developments such as Plan S. Plan S calls for research funded by certain European funding agencies to be published immediately as full open access. In cases where the funding agency does not cover the cost of OA publishing, the burden of the cost is, in most cases, pushed back to the researchers themselves who must find funds to pay an APC for OA publications.

The federal government of Canada has made OS a high priority, developing key policies and investing in open science initiatives. The extent of commitment to open science is exemplified by Canada’s Tri-Agency Open Access Policy on Publications as well as the recent G7 Science and Technology Minister’s recommendation to establish an international working group on open science. Environment and Climate Change Canada is leading the Open Science commitment in Canada’s 2018-2020 National Action Plan on Open Government. The Chief Science Advisor has recently released an Open Science roadmap with the stated objective to provide principles and recommendations to guide Open Science activities in Canada. The roadmap’s recommendations are intended for science and research funded by federal government departments and agencies.

With numerous concurrent OS initiatives underway, there is value in convening stakeholders to share progress on these initiatives. The purpose of the 2019 Canadian Science Publishing (CSP) and Royal Society of Canada (RSC) Open Science Workshop was to discuss Canada’s position in the open science landscape, share current open science initiatives that are taking place in Canada, and identify opportunities for collaboration. What follows is a summary of the workshop.
Summary of the workshop

Opening remarks

The workshop was chaired by Dr. Janet Halliwell, who represented both CSP as Chair of their Board of Directors and RSC, as a recently elected Fellow. Janet opened the workshop with introductory remarks, discussing the distinctions between OS and OA and indicating that for the purposes of the workshop, the term “science” refers to all academic endeavors. Janet stated that OS suggests that all science should be inclusive, both within and beyond the scientific community, as enabled by evolving digital technologies. OS calls for all components of scholarly research to be made freely, fully, and immediately accessible to anyone that wishes to access them. OS includes OA, and typically extends to other open research outputs, including data, research methods, peer-review, and citizen science.

OA often refers to the free access to scholarly publications (i.e., peer-reviewed journal articles) and that definition can also extend to books, reports, patents, and other research works. OA has been discussed and debated for decades, but Plan S, which calls for research funded by certain funding agencies to be made immediately OA, has renewed the discussion and spurred a number of new initiatives and agreements that signal an accelerated shift to OA. There are both threats and opportunities associated with this change, particularly for country-specific small publishers, but if we can address these effectively then OA will enhance the value and impact of research at both the national and international stages.

Dr. Halliwell concluded her opening remarks by indicating that the academic world is clearly moving to “open” but there remains the challenge of how to effectively manage and fund this shift. One fact is certain, that such a large shift requires the collaboration and cooperation of a great range of stakeholders, including research libraries, e-infrastructure, universities, policy/research funding organizations, academies, publishers, research administrators, and researchers. The key question is, how can we unite and work together?

Canada’s position in the Open Science Movement

The keynote presentation was delivered by Dr. Masha Cemma, who is a Policy Analyst in the Office of the Chief Science Advisor of Canada, whose portfolio includes OS. Dr. Cemma indicated that although the focus of her work is on OS in Canada, her office monitors OS trends and she has noted four overarching themes related to OS: immediate OA, FAIR data (which are a set of guiding principles that encourage data to be made findable, accessible, interoperable, and reusable), infrastructure, and culture change.

The Canadian federal research funding agencies (i.e., Natural Sciences and Engineering Research Council of Canada [NSERC], Social Sciences and Humanities Research Council of Canada [SSHRC], and Canadian Institutes of Health Research [CIHR]; and the Canadian Foundation for Innovation [CFI]) along with Genome Canada have recently signed on to the San Francisco Declaration on Research Assessment (DORA), which recognizes the need to improve the ways in which the outputs of scholarly research are evaluated.
One of the main benefits of OS is that it adds an element of equity in terms of access to scientific products around the world. Globally, a number of agencies and organizations have signed on to Plan S, including the recent addition of the World Health Organization. Philanthropic organizations have also been very keen on OS, including the Wellcome Trust, Gates Foundation, and the Chan Zuckerberg Initiative. The European Commission 2016 proposed the Amsterdam Call for Action on Open Science. There are a number of international open science initiatives that are currently underway. For example, in France, Digital Republic Law and National Plan for Open Science are initiatives that enabled that country to be part of the global OS movement. The French National Center for Scientific Research (CNRS) published the Roadmap for Open Science in November, 2019. In Germany, there have been a number of negotiations with big publishers over last few years, including Projekt Deal. In Japan, a 5-year science and technology basic plan to coordinate scientific activities has been instituted with a focus on data management plans and data policies, including the development of infrastructure to manage and house data. In the U.S.A., there are a number of initiatives that are taking place by the National Institute of Health and National Science Foundation, along with the President’s Office of Science and Technology policy.

In Canada, Canada’s federal funding agencies signing DORA and the upcoming tri-agency research data management policy are two of the key initiatives that the federal government is spearheading. There are a number of organizations beyond those represented in this workshop, that are leaders in OS in Canada, including the Structural Genomics Consortium Toronto Open Science initiative, the Canadian Open Neuroscience Platform (CONP), and the Canadian Association of Research Librarians (CARL) open access commitments. Within the federal government’s intramural research scope, there was a 2014 directive on open government, open government partnership, and the open data portal. The mandate of the Chief Science Advisor is to make government science fully available to the public. Over the last year, the office has been working on a road map for open science, which will be released soon. The goal of the road map is to move Canada forward in OS, as it is clear that this country has lagged behind in comparison to many European nations. The office engaged a small number of experts from different disciplines, including information technology to develop the road map.
Questions from the audience

**Q:** Does the OS roadmap account for nuances between different organizations and research cultures?

**A:** MC - The OS roadmap is very high level. It provides a number of recommendations and encourages the creation of agency-specific open science plans. However, it is ultimately up to individual organizations how they would like to proceed. The first recommendation is to consult with the agency’s own scientists and researchers to engage in dialogue in order to formulate an action plan.

**Q:** Can you summarize some of the perceived threats of the move to OA? What can publishers do?

**A:** MC - If Canada doesn’t move forward with OS initiatives, it might be more challenging to engage in international collaborations, in the future. There is also a need to be able to articulate what research should be open and closed. From a publishing perspective, there are many unknowns with respect to sustainable revenues but it is clear that engagement with academic societies will be important.

**Q:** Does the OS roadmap focus on open scholarship as well?

**A:** MC - Yes, open scholarship is one of the main aspects of the OS roadmap.
Open Science lightning panel discussion

The lightning panel convened a range of stakeholders whose organizations are undertaking various OS initiatives in Canada. The session began with each speaker introducing themselves and providing a description of the work that they are doing in the OS space and then they answered questions from the audience.

Clare Appavoo, Executive Director of the Canadian Research Knowledge Network (CRKN), indicated that CRKN has recently launched new strategic plan, with the vision statement that the “world’s knowledge is accessible by all”.

CRKN licenses scholarly journal content on behalf of its members, who are comprised of Canadian university libraries, and has been exploring a transformative strategy for access to scholarly publications. Any transformative strategy would fit within a broader strategy of transforming scholarly communications and access to knowledge, including the ongoing development of open infrastructure. Transformative agreements between publishers and consortia or libraries are proposed as part of the solution, where the model shifts from subscription fees to fees for the publication of OA papers. This concept preserves academic freedom of authors while accelerating the transition to OA. This shift brings OA to researchers where they can read and publish, uniting multiple stakeholders. CRKN is working with partners and stakeholders to develop a holistic understanding of the money being spent on subscriptions and OA.

Canada is producing 4.3% of global research output which is relatively high for the population of this country. Approximately 3.4% of that research is published as gold OA, as identified by Directory of Open Access Journals, which is a community-curated list of open access journals. CRKN manages $125M for subscription access for researchers at Canadian institutions. It is estimated that CRKN members spend approximately $35M on Gold OA fees.
Dominique Roche, Postdoctoral Fellow at Carleton University, provided a presentation entitled *Open data: What drives Canadian researchers to share?*

Dominique’s research program aims to better understand the factors that influence researchers to share or not share their data. There are a number of benefits to sharing data, including avoiding data being lost to science; accelerating scientific discoveries; improving return per research dollar; and increasing the ability to reproduce and validate published results. Funding agencies are aware of these benefits and are increasingly implementing policies that encourage or promote better data stewardship and data sharing practices. For example, Canada’s federal funding agencies instituted the research data management policy, where research funded by those agencies is encouraged (but not obligated) to be made public. A similar policy that applies to federal government research will soon be released.

Roche et al. 2015 (PLOS Biology) found that data sharing is low in the field of ecology and evolution. In principle, data sharing is generally viewed as being a positive aspect of research. However, in practice, many researchers are concerned about sharing their data. Some of the reasons for this include people misinterpreting the data and methodology, fears over research being scooped, and concerns that others will find errors in the data or analysis. The next step in improving data sharing is to understand what motivates Canadian researchers to share their data. Roche conducted a survey which revealed that 22% of data sets among respondents from the fields of ecology and evolution were open. These data were typically shared on large scale repositories such as Dryad, Figshare, and Zenodo. Some data sets were shared on personal websites or included supplementary material, which may be problematic since it is harder to access that information or it could be behind a publisher’s paywall. Future research will look at predictors of data sharing, including factors such as gender, career stage, journal data policy, and journal impact factor. They will also explore repeatability and whether or not researchers are sharing good quality data irrespective of whether the journal requires it.

Shannon Cobb, Policy Analyst, Natural Sciences and Engineering Research Council (NSERC) presented on the role of the Federal Government of Canada’s funding agencies in supporting research and research data. The Federal Government of Canada recognizes the value of research data and public funded agencies are strongly advocating for making results of research funded by themselves as accessible as possible. Some of the main initiatives to accomplish the goal include the open data portal, the Tri-Agency (i.e., NSERC, SSHRC, and CIHR) OA policy on publications, the draft research data management policy, and the recent signing by the Tri-Agencies of DORA, which recognizes the need to improve the ways in which the outputs of scholarly research are evaluated, beyond the journal impact factor.

The Tri-Agency OA policy on publications, which was instituted in 2015, requires that any research funded from grants must be made available online within 12 months of publication. Compliance can occur by either depositing the full text peer reviewed manuscript in a publicly available online repository, or by submitting the paper in a journal that offers OA within 12 months. Research data management is part of research excellence and becoming a key aspect of research methodology. The Tri-Agency’s Research Data Management Policy is being developed to enhance research dissemination and improve the impact of research. The policy is slated for release in early 2020. The proposed requirements for the policy is that federal research institutions are
encouraged to have a research data management strategy, authors should have data management plans, and research data should be deposited in appropriate repositories. Since certain data should not be made open, the policy clearly stipulates that it is a data management policy rather than an “open data” policy. The rollout for the policy is planned to be phased and incremental to give stakeholders a chance to develop their plans.

**Alexandra Freeland**, National Research Council (NRC) provided open science perspectives from the NRC Knowledge, Information and Technology Services. The NRC has 14 research centers and open science is important to each center. For example, the Herzberg Astronomy and Astrophysics Research Centre has open astronomy research data through the Canadian Astronomy Data Centre research facility. For OS initiatives, it is critical that there be alignment within organizations with researchers both within and outside the NRC. Many NRC research programs deal with sensitive projects and intellectual property, in which researchers apply principles of privacy acts for the Government of Canada. Yet there is still confusion among researchers based on these rules. However, many of the NRC research centers are already complying with pre-existing requirements for proactive disclosure and information is posted regularly on the Open Government portal. An OA repository already exists, housing data from 1996 to present, with an embargo period. The repository incorporates datasets into a digital and open infrastructure repository, including a large historic print collection, for the purpose of increasing the discoverability of NRC’s research. The NRC-led Federal Science Library is a partnership of seven federal science libraries that have joined together to establish a portal that enables searching print collections and repositories of all the libraries. The NRC Knowledge Information and Technology Services is also developing an action plan in preparation for the Federal Open Science road map.

There is a need to focus on investing in institutional repositories and finding ways to link with the many discoverable platforms out there in order to enhance cross-platform search functionality. Managing research data and open science department initiatives is key to the move towards full OS.

**Dick Bourgeois-Doyle**, represents the Canadian Commission for United Nations Educational, Scientific and Cultural Organization (UNESCO) and provided perspectives on a UNESCO recommendation for open science. UNESCO considers OA and OS to be very high priority, since that organization has a long-standing philosophical interest in promoting OA and rights to access science information. In 2017, UNESCO released the Recommendation on Science and Scientific Researchers, which recognizes both OS and OA.

Over the past two years, there has been interest from UNESCO to develop a discrete and specific statement of recognition on OS/OA and definitions. In late 2019, there was a vote to launch a roadmap on consultations towards the development of an individual statement of OA from UNESCO. This presented an opportunity for CC UNESCO to offer the Canadian national perspective on these issues and to influence an international statement on importance of OS. Canada has the largest youth advisory group of any national commission of UNESCO and they are fully engaged in OA/OS and led a report on Canada’s statement on OS.
Questions from the audience

Q: With so many research initiatives in the external research world as well as with the government, how does Canada move forward as a collective entity on OS? What are the key things that should happen?

A: SC – We have to understand the impacts that OS will have on the research community and the community in general, to understand the publishing landscape as well as societies and their involvement. Once we understand that, we have to start looking at requirements for researchers. There is already discussion about how we can better work together. MC – We need to have more open discussions with those external stakeholders and need to work towards a single approach to open science, engaging with university and research communities. DR – As a researcher, it is encouraging to see that there are many OS initiatives on all sides. Canada signing on to these agreements, like DORA, is a good first step. We need to make sure there’s a focus on training as many researchers and government scientists are unaware of some of the processes related to open data, for example. AF – We need to ensure there are funds available for resource allocation to support OS initiatives. We have all agreed on goals and outcomes, but not yet agreed on resource allocation level. DBD – To get there from here we need to spend money and experiment in various forms, but we also need something to drive the change. Perhaps we can look beyond the government and academic research community and engage all communities. Also, we are fortunate that the Office of the Chief Science Advisor is helping Canada to formulate the next steps through the OS Roadmap.

Q: There seems to be some confusion between commercialization of science, intellectual property, and OS – could you comment on whether we see this as a barrier (i.e., importance of proprietary info and ideas are somewhat at odds with each other)?

A: AF – Where there’s ambiguity about what should and should not be open, we need to enable access to that information but also be aware of the potential harms. In other words, if there is no harm in sharing the information, then why are you not sharing it? For example, NRC might have information from a small company where their future success might depend on that information being protected so we need to think about the specific ramifications of that. Clearly this is a component of OS that everyone needs to spend more time discussing and taking apart in deciding policies on. DBD – Some people are passionate about protecting their data but we may reach the point where they have a greater societal impact to share the data. That has to be considered in the regime of OA. DR – Yes, for example, researchers that collaborate with pharmaceutical companies.

Q: Are their plans for training researchers about how to advocate for open access? What about research ethics boards? Second Q for DR: What factors explained why researchers agreed to share their data?

A: SC – We do plan on helping to support activities and partnering with other organizations (e.g. Portage) with workshop training, information, and resources.

Institutions play a huge role, for example, Research Data Management is not just about
the infrastructure side but also about the training aspect. If awareness is not high in the beginning, it will be difficult to increase awareness as the policy rolls out. With respect to research ethics, during the development of consultation for Research Data Management, we did engage with ethics boards and we do recognize that there are issues around consent and data sharing so the policy was developed in such a way as to make sure there will not be conflicts. DR – Choice of repository had an influence on whether or not researchers agreed to share their data. The repositories listed were only a few examples amongst thousands that the researchers had chosen from. Figshare is partly for-profit (repository is not), Dryad is self-funded, Zenodo is run by CERN. Can be a challenge to find a suitable repository for all researchers but there are databases that exist that provide information on which OA repositories might be suitable for different needs.

Q: As part of a transformative plan, has anyone run numbers to determine whether parties would be paying for publishing more than they do right now?

A: CA – I firmly believe they would not pay more for publishing than they do now based on calculations coming from other countries. If you look at the money we are already spending, it comes from more sources than just library budgets. For example, if we re-purpose money going toward Article Processing Charges from research grants, then we can perhaps transition those to a transformative model.

Q: Does it make sense to have a global perspective about OS and not think about situating OS – should it be different for different parts of the country, different gradients of open?

A: DBD – this is the kind of perspective we could advance as a country, as it would resonate and ensure potential outcomes are not globally focused.

Q: Why isn’t Canada joining Plan S?

A: SC – Agencies were contacted by coalition S and were asked for their interest to join. The response at the time was that we have our existing policy in place, and that we are trying to concentrate on getting this right before taking on an aggressive plan. If we were to sign, we would need to make sure that the impact of joining Plan S will not have
negative consequences to researchers, professional societies, and Canadian publishers. So it is not necessarily a no, but we are not planning on joining right now. That said, we might try to align our policies with some principles of Plan S and there are some that we are already aligned with. There was discussion at the Canadian Science Policy conference about this as well. We would need to get different perspective about this issue from the Canadian research community.

Q: In the humanities and social sciences in particular, there is concern with regards to funding OA. How is monograph publishing being integrated into this national reflection and movement towards OA?

A: CA – it is a different environment, we are aware of this. Funding agencies and publishers should gather to determine long term strategies for this. Some interesting things happening in the US at the moment. For example, U of T is publishing monographs digitally and it is not impacting sales negatively. DR – there are consortia that exist.

Q: Considering a national program to move monographs to OA but without any additional funding has risks and we cannot forget that OA publishing is not free. What impact will this have on university presses?

A: JH – this question is for all publishing: how do we transform to sustainable and viable business model that retains quality of Canadian scholarship? Monographs in humanities and also sciences have been largely left out of the OA conversation and all publishing does not have a sustainable model yet. This is clearly an area where we must work together (i.e., editors, institutions, funders). Funders have to look at their policies and practices in a different way to find solutions.
Open Access business models

Suzanne Kettley, Executive Director of Canadian Science Publishing (CSP), indicated that CSP has had a long interest in and support of OA. CSP is a not-for-profit scholarly publisher that publishes three fully OA titles, FACETS: Canada’s first and only OA multidisciplinary science journal, Arctic Science: science & engineering related to northern polar regions, and Anthropocene Coasts: multidisciplinary research related to anthropogenic activity in coastal regions. CSP also publishes their suite of 21 hybrid journals in which authors can post the accepted version of their manuscript to a repository or archive at no additional cost. Suzanne introduced Michael Donaldson to speak on the OA business models that CSP is exploring.

Michael Donaldson, Open Access Specialist at CSP, indicated that CSP has established an external open science working group of diverse Canadian stakeholders who are undertaking open access initiatives. The purpose of this group is to develop strategies for Canada’s involvement in the global open science movement. The main goals of the group are to unify participants with an interest in open science in Canada, discuss national and international open science news and events, and engage the broader open science community to consolidate our efforts and amplify our message. Working group participants include Antonia Pop (University of Toronto Press), Dominque Roche (Carleton University), Eleanor Haine-Bennet (Canadian Council for UNESCO), Kevin Fitzgibbons and Shannon Cobb (NSERC), Alexandra Freeland (NRC), Catherine Steeves (Western University), and Masha Cemma (Office of the Chief Science Advisor).

As OA rapidly grows, there is a need to identify sustainable OA funding models. There are costs associated with scholarly publishing, which have historically been covered through subscription costs but OA has signaled a shift to an “author pays” approach. Transformative models are the next wave of OA and are signalling a whole-scale shift from the subscription model to OA models. To illustrate this shift, as of November 2019, 70+ institutions in 10 countries have “read & publish” deals. Plan S has been the catalyst for much of this movement, particularly in European countries.

Plan S is an open access publishing initiative, led by an international consortium of research funders, which requires that from 2021, scientific publications that result from research funded by certain European funders must be published in compliant Open Access journals or platforms. Currently, CSP is working towards ensuring that all of their journals are compliant for Plan S. CSP is working with the University of Toronto Libraries TSpace team (the repository that CSP partners with) to ensure that TSpace is compliant. We are looking into our licensing terms to find a way to ensure that the accepted version of any manuscript we publish can be compliant with the Plan S licensing requirements. With the more lenient timeline of January 2021, we have some flexibility to work towards ensuring these requirements are in place before the Plan is fully implemented.

To investigate OA business models, CSP established an internal working group with the purpose of selecting and validating potential business models that could be used to fund open access publication costs. The internal working group will consist of three phases:

1. Scoping: researching and evaluating existing models and/or developing new models
2. Refining: validating the top candidate models by determining requirements, workflows, and developing cost/revenue estimates, and approaching partner organizations
3. Testing: implementing one or more models in a pilot project
CSP’s team is exploring ways to reduce reliance on the author-pays APC but ensure publishing costs are covered. Currently, their initial focus is on CSP’s 3 fully OA journals but they are concurrently exploring options to “flip” some of CSP’s 21 subscription-based journals. The team identified five essential criteria for their model selection approach:

- Reduce reliance on author-pays article processing charge
- Effectively offsets publishing costs and provides a small margin to enable investment in the future
- Robust (i.e., capable of withstanding market fluctuations and unexpected scenarios) and Sustainable (i.e., effective both now and in the future)
- Easy to implement and administer for both CSP and our partners
- Scalable and flexible (i.e., could be applied to other journals; flexibility to combine models or parameters)

The team’s initial survey of OA funding models resulted in 15 models that were determined to be potentially relevant to CSP and warranted further investigation. Among the “pure OA” models, the membership models, namely institutional, consortial, and society memberships, were the only models ranked as having “very high” potential for CSP. Membership models would enable us to gradually transition away from an author-pays article processing charge, would enable us to set pricing to offset CSP’s publishing costs, would be robust and sustainable during a transition to open access, would be easy to implement and administer both for CSP’s partner institutions and for CSP, and would be scalable with built in flexibility to accommodate a multi-model approach, should CSP wish to adopt one or more transformative models in the future.

Among the transformative models, the read and publish and publish and read models had the highest potential for CSP as these approaches enable the bundling of subscription and open access journals into a single contract which could be attractive for both existing and prospective institutions. A read and publish model would also be compatible with membership models and there exists potential to merge the models in the future or to have a mixed-model approach. In effect, the membership model could form the foundation upon which CSP could develop the read and publish model. This combined approach could also enable the integration of external funder subsidies, which would in turn lower costs for the partners that participate in the membership models.

There is likely no single model that will satisfy all of CSP’s needs; however, a combination of models, that can be modified and adapted over time, may be the best approach to developing an effective and long-term strategy. CSP envisions the membership model as a transitional strategy that would set the stage for a potential longer-term investment in a transformational approach, that would build on the relationships that CSP establishes with the membership models. External funders could also subsidize the models, which would in turn lower costs for partners.

In terms of next steps, the membership model parameters need to be refined and validated before launching a pilot project in 2020. Depending on the results of the pilot, CSP will continue to explore transformative models as well, which may be combined with (or may replace) a membership model.
Questions from the audience:

Q: Tell me about the membership model. BMC were one of the first to go that path, and authors tried to exploit by using co-authors as members, or universities only have a limited number of papers that they will support. How do we get beyond that, is there a limit on these models?

A: MD - Across the board, there are limits. For example, PLOS One has offered institutional memberships for years but their terms vary depending on the agreement they make with each university library. Deciding on terms that work for everyone is difficult and is something that has to be decided on by each institution or library. CSP is looking at international partnerships to reach new authors and readers.

Q: I appreciate sharing internal working group insights. With respect to transformative agreements, what about offering a new home for existing journals who want to flip from subscription to OA? For example, the Journal of Informatics was published by Elsevier and is now published with MIT University Press and has transitioned to full OA with APCs waived for 2 years. Does CSP as a non-profit publisher welcome scientists by saying if current publisher doesn’t offer what you want we will publish your journal?

A: MD - This has been a very interesting development and although it is not something that we are actively pursuing, we are certainly interested in speaking with potential new partners. Vincent Lariviere (Université de Montréal) also said something along those lines that CSP might be a good fit as a publisher to do this. SK pointed out that we need to solidify first what that model would like before we open our doors but we’d be very excited about that prospect.

Q: There are 3-4 mega-players out there, how is CSP as a small publisher able to change the system? What are big players doing and should we wait for them to flip or would Plan S force them to flip?

A: MD - That process has already started. Elsevier just announced a new transformative agreement last week, for example. We are small and unique in Canada where we do not have other peers who are the same structure, this makes it very challenging but also presents opportunities. The bigger publishers have the ability to take on big risks but we do not. That said, being a not-for-profit means that we have a lot of support, in Canada we are privy to some high-level and diverse discussions (e.g. look at our panel today), and we think that we are recognized as important players in this space. That said, we are being active but somewhat cautious in how we charge forward with this. That is the reason why we are doing the piloting and sharing the results.

Q/comment: Coalition Publica is in the middle of 5-year agreement around partnership to OA and we are open to discussions and exchanging the ideas.

A: MD - We would welcome further discussion and the opportunity to discuss potential collaborations.
**Discussion Question:** Is there a sense among this room that these models can fit the research community? What are your thoughts on transformative models?

**A:** MD - From the perspective of a science department with the Government of Canada, it feels like [a transformative approach] is the best model to look for. If we are doing initiatives to make science more accessible and maximizing the funds that we have already used to do the research, it makes sense. But we cannot go back for more money, we would have to leverage the money that we already have in subscription agreement with publishers as a funding agency. Any model that the government follows should repurpose existing funds.

**Q/Comment:** From doing research on scholarly communications, there is a concern that big publishers could use transformative approaches as another way to enable double-dipping. Without APCs being made transparent and affordable, for-profit journals could simply use this as a way to make more money.

**A:** MD – There have been calls for more transparency with the APCs and we certainly believe in that approach. However, there is no obligation with Plan S to do so for example.

**Q/comment:** We need to understand more about libraries and expenditures. Perhaps a survey to look at OA infrastructure for other parts of OA. Need to have a sustained discussion to understand what is the collective amount and how might it be distributed.

**Q:** With respect to journal metrics, young students from other countries (e.g. China) say they have to publish in a certain list of well-known journals. If we go towards the direction of membership model and OA, how do we encourage people to keep our journals in mind?

**A:** JH – For that, we will need a culture change. Perhaps European activities like Plan S could influence this. It will take a long time to address that culture change

**A:** MD – As part of the open science discussion there has been a lot of discussion on evaluation for tenure, jobs, etc. It is a challenge but we need leaders from various stakeholder groups to come together to take charge on this.
Concluding remarks

Janet Halliwell provided summary remarks to conclude the session, drawing out a number of the key issues raised. She indicated that there is a need to take a collaborative, collective approach among publishers and stakeholder groups including librarians, institutions, government in-house and out-of-house, and funders. Issues to pursue:

• We need to be sensitive to the funding challenges of humanities, social sciences and society journals and monographs.
• There is a need to establish a policy framework for these discussions in Canada but also to look at this situation in a global context. Scientific publishing has a global reach in terms of engagement and impact.
• We have heard a lot of discussion about principles around affordability for researchers, including transparent APCs. Can OA publishing be affordable and what is the pricing structure?
• There is also the issue of ensuring the integrity of our publishing enterprises, especially if we move rapidly towards full OA.
• Perhaps we need a one-Canada strategy, including a common approach and infrastructure. There is certainly a critical need for alignment of incentives and policy.
• There is a lot of money in the scholarly research system but we do not know where it is or how to mobilize it. We need a catalytic investment as a nation to restructure how funding flows; we should recognize that there will be different experiments with OS and OA because there are different dimensions in the system.
• As for Plan S, Canada has been approached, and we have policies already. However, they are not fully aligned (e.g., a 12 month embargo rather than immediate OA). The pros and cons of moving towards Plan S require more discussion and consultation. Can we as a nation influence the evolution of Plan S to make it work in Canada?
• Countries like Canada have a strong intellectual focus on scientific literature; how can we affect change?
Speaker biographies

Janet Halliwell – Facilitator, Chair, Board of Directors, Canadian Science Publishing

Janet Halliwell serves as the Chair for Canadian Science Publishing’s Board of Directors. Janet also serves on the Board of Directors of Genome BC, the Fields Institute for Mathematics, the Advisory Board for the Quebec Interuniversity Centre for Social Statistics, and the Advisory Council of the Cluster on Population Change and Lifecourse. She chairs Genome BC’s Board Committee on Genomics and Society and is Chair of the Board for two Not-for-Profit S&T organizations - CASRAI (Consortia Advancing Standards in Research Administration) and the Canadian Science Policy Council responsible for the annual CSPC conference. Janet previously served as Executive Vice-President of the Social Sciences and Humanities Research Council (SSHRC); she also acted as Chief Operating Officer of SSHRC from September 2005 to August 2006 in the absence of a full time President. From 1975-1996 Janet served the research and academic communities in other executive, advisory and management positions. Janet is the Principal of JE Halliwell Associates Inc, a company established to offer value-added services in policy and management consultancy relating to post-secondary education and science and technology, particularly publicly-funded R&D.

Masha Cemma, Policy Analyst, Office of the Chief Science Advisor of Canada

Dr. Masha Cemma is a policy advisor to the Chief Science Advisor of Canada. In that capacity, she advises on open science and supports the work on the Roadmap for Open Science for the Government of Canada. Prior to working with the Chief Science Advisor, Dr. Cemma has completed a Mitacs Canadian Science Policy Fellowship at the Canadian Food Inspection Agency (CFIA). At the CFIA, she served as the secretariat for an international high containment laboratory network, BSL4ZNet, that fostered international cooperation, knowledge translation and exchange with the goal of strengthening preparedness to high-consequence pathogens. While at the CFIA, Dr. Cemma’s work was recognized with the President’s award in Innovation and Best Practices. She was selected as an Emerging Leader in Biosecurity by the John Hopkins Centre for Health Security and an Action Canada fellow by the Public Policy Forum. Dr. Cemma earned her PhD in 2016 from the Department of Molecular Genetics at the University of Toronto. During her PhD, she examined the role of autophagy machinery in host defence. Her foray into policy work was through a global health fellowship at the World Health Organization in 2014.

Clare Appavoo, Executive Director, Canadian Research Knowledge Network

Clare Appavoo is the Executive Director of the Canadian Research Knowledge Network (CRKN). CRKN is a partnership of Canadian universities, dedicated to expanding digital content for the academic research and teaching enterprise in Canada. Through the coordinated leadership of librarians, researchers, administrators and other stakeholders in the research community, CRKN undertakes large-scale content acquisition and licensing initiatives in order to build knowledge infrastructure and research and teaching capacity in Canada’s universities. Prior to joining CRKN, Clare worked as Director, Sales and Strategic Support at Ingram, Coutts Information Services. She holds a BA and continues her education at York University. One of CRKN’s priorities is gaining a better understanding of how publishers, libraries, and consortia can work together on transformative agreements related to open access.
**Dominique Roche**, Postdoctoral Fellow, Carleton University

Dr. Dom Roche is a Marie Curie postdoctoral fellow at Carleton University. He is an ambassador for the data repository figshare and the Center for Open Science. His work has focused on evaluating the efficacy of editorial policies at achieving high quality open data in ecology and evolution. A main objective of his research is to increase awareness and facilitate dialogue among scientists, journal editors and the public with respect to the importance of archiving primary research data while highlighting areas of current practice in need of improvement. He is leading a number of open science projects, geared towards understanding the factors that lead Canadian researchers to share high quality research data, understanding the benefits and costs of open data for individual researchers, investigating how open data practices influence the reporting of research methods and results, and determining if training in data management improves the quality of open datasets.

**Shannon Cobb**, Policy Analyst at Natural Sciences and Engineering Research Council of Canada

Shannon Cobb is Policy Analyst in the Policy and International Relations Division at the Natural Sciences and Engineering Research Council of Canada. Shannon's open science portfolio has included work on the implementation of the Tri-agency open access policy (2015) as well as the establishment of the Tri-Agency research data management policy. She has been involved in a number of collaborative open science initiatives with organizations such as the Canadian Association of Research Librarians, Portage, and the Organisation for Economic Co-operation and Development. Just last week, she convened a fascinating panel at the Canadian Science Policy conference that discussed whether or not Canada should adopt Plan S.

**Alexandra Freeland**, Director, Library and Information Management, National Research Council Canada

Alexandra Freeland is a senior director at the National Research Council, with responsibility over the NRC’s National Science Library, information and data management, and access to information and privacy programs. In this role, Alexandra collaborates within the NRC, the federal government, and the broader Canadian library community, and is currently leading a number of initiatives that contribute to open science outcomes. Alexandra has over 25 years’ experience managing the design and delivery of integrated information, library and research services, and has post-secondary degrees in English, law and library science.

**Dick Bourgeois-Doyle**, Canadian Commission for UNESCO

Dick Bourgeois-Doyle is a Canadian writer, a Canadian Science Publishing columnist and science administrator with an interest in innovation history, research ethics, and gender issues in technology. A three-time recipient of the NRC Canada Outstanding Achievement Award for public awareness of science and other recognitions, he has contributed to science promotion in Canada and abroad. He currently serves on the Natural, Social, and Human Sciences sectoral commission for the Canadian Commission for UNESCO.
**Suzanne Kettley**, Executive Director, Canadian Science Publishing

Suzanne Kettley is the Executive Director of Canadian Science Publishing (CSP), Canada’s not-for-profit leader in mobilizing scientific knowledge and publisher of 24 journals including FACETS, Canada’s first multidisciplinary open access science journal. With more than three decades of experience as a scientific publishing professional, Suzanne has held several positions in the company and led the team during CSP’s transition from the federal government to the private sector. She is also Secretary-Treasurer of the Canadian Association of Learned Journals (CALJ), sits on the STEM Fellowship Board of Directors, serves on the editorial board of Scholarly and Research Communications, and is Club Secretary for East Ottawa Toastmasters.

**Michael Donaldson**, Open Access Specialist, Canadian Science Publishing

Michael Donaldson is the Open Access Specialist at Canadian Science Publishing. The purpose of Michael’s position is to identify strategic directions to keep pace with the global open access movement. Michael has previously held the roles of Managing Editor and Content Development Manager at CSP. Michael has over 15 years experience in scholarly research, having completed a post-doc at the University of Illinois, a PhD at the University of British Columbia, and an M.Sc. and B.Sc. at Carleton University, where he is currently an Adjunct Professor.

**Contact information**

For more information about the workshop or other open science initiatives, please contact Michael Donaldson Michael.donaldson@cdnsciencepub.com.