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Scholarly Publishers Seek to Support Federal Open Science through Collaboration

Response to RFI: Implementation and Changes to Science Policy Document
(SPD)-41: Science Information Policy

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Submission relevant to all Science Mission Directorate (SMD) divisions

In response to NASA's Request for Information (Solicitation Number: NNH22ZDA006L), I am pleased to offer the following comments on behalf of STM, which supports scholarly publishers in their mission to advance trusted research worldwide. As part of this mission, STM and its members believe that the sharing of high-quality research outputs throughout the research life cycle is critical to strengthen science and scholarship. Open practices can add to the quality, speed and integrity of scholarship and research. We therefore are keen to collaborate with NASA on its efforts to improve its scientific information policy, transform research practices to Open Science, and make 2023 a year of Open Science.

STM's membership includes more than 140 members that collectively publish 66% of all journal articles and tens of thousands of monographs and reference works. As academic and professional publishers, learned societies, university presses, start-ups and established players we work together to serve society through efforts to ensure research is of high quality, trustworthy and easy to access. The information stewarded by STM's members includes publications, data, software, and other information that supports discovery and innovation throughout the scientific and scholarly enterprise.

STM publishers support all models and approaches that have the potential to lead to a more open scholarly communication environment and a greater empowerment of researchers. We work diligently with stakeholders across the research ecosystem to build towards a future where quality, rigor, replicability, reproducibility, and integrity of research can be sustained while meeting the access needs of researchers and the public. STM's commitment to an open research future has been recognized by the European Union through our designation as a Research Data Champion. We regularly participate in many multistakeholder projects which drive Open Science in a collaborative manner. We would welcome the opportunity to work with NASA to achieve a shared vision of an Open Science future and offer this response in that spirit.

Response to the question on impact of the proposed changes or additions to SPD-41

Support for FAIR data: NASA’s policy to follow the FAIR Guiding Principles, alongside the other requirements that are aligned with disciplinary and practitioner standards, will have a positive impact on the sharing of research data. We are strongly supportive of such efforts and have been actively engaged similarly, through multi-stakeholder collaborations in the Research Data Alliance and other multistakeholder partnerships. Care should be taken to ensure that policies and data management plans continue to be aligned with stakeholder practices to avoid any issues with interoperability or undue burdens on researchers. To that end, we are pleased to see that community standards are listed in Appendix A, including the data policies of AGU and AAS. The [COPDESS initiative](#) might be a good addition to the references as a broader effort that could be applicable to many NASA-funded communities.

The overall impact of the changes to the policy is the likely elevation of data to a first-class research object. This will help support the cultural changes needed to wider ensure data sharing. The specificity of the requirements should also help to avoid the creation of data management plans that only make data “available upon request.”

One potential negative impact relates to Section II.B, where the descriptions of “Publications” and “Data” significantly overlap. To avoid potential confusion, it would be helpful to clarify that “Data” does not include publications or manuscripts in any form. Similarly, definitions should be clear as to the distinction between research data and other potential supplementary materials associated with a published article. Some supplemental material may not be underlying research or scientific data and instead are content associated with the article that carry the same DOI and are subject to the same intellectual property rights as the rest of the article.

Impact on the quality and integrity of the scholarly record: Our member organizations support broad access to the scientific literature and are innovating for Open Science. The carefully considered, collaboratively developed policy that requires free access to articles no later than 12 months after publication, as maintained in the proposed revisions to SPD-41, is the best way to ensure that progress continues. Less flexible approaches would threaten investments in the research communication system and put at risk icons of American scientific leadership, including those published by several of our members. It would place increased financial responsibility on taxpayers, rather than allowing a global research community to contribute to the communication of scholarship. This flexibility ensures that scientific societies and other scholarly publishers will be able to continue their work to advance science, health, and innovation. This work includes managing the peer review process, revision, and copyediting; preparing manuscripts; creating extensive links to related research outputs; providing electronic and print distribution; and ensuring discovery and deposit into long-term archives. It

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includes support for research communities and the American scientists who are key to future generations of discovery and innovation.

Alongside this flexibility, funding is needed to ensure that authors who choose to publish in gold Open Access journals have the resources needed to support their publications. The fact that the FAQs emphasize that publishing in such journals is an acceptable use of funding will help encourage authors to choose that option as appropriate, and further help support the ongoing quality and integrity of the research literature. Surveys indicate certain researchers believe that supporting publishing is an inappropriate use of grant funding.¹ STM would welcome the opportunity to work with NASA to explore what economic and behavioral factors, including attitudes toward immediate Open Access models, may be contributing to a resistance toward greater adoption of gold Open Access.

Although we are supportive of the appropriate use of preprints – and some of our members operate preprint servers – we have some concerns that without policies and safeguards that help users of preprints to understand their status as unreviewed manuscripts, the progress and public understanding of scholarship could be limited. We therefore encourage NASA to include additional guidance on labelling preprints and distinguishing between preprints and the version of record alongside the encouragement of the posting of unreviewed manuscripts that appears in the FAQs and elsewhere.

We appreciate that SPD-41a explicitly recognizes the importance of curation. Efforts will be needed to ensure that appropriate curation continues to take place to avoid information overload and misinformation. Critical to the availability of curation is the support for the investments needed in publishing and other platforms.

The need for community-based standards and persistent identifiers: The requirement for persistent identifiers for all research objects and the commitment of SMD to provide a persistent identifier for funding mechanisms may have significant impact. Publishers already invest heavily in creating persistent identifiers and machine-readable metadata that promote greater visibility of research findings and data, and these help to promote trust, replicability, reliability, and transparency for the scientific system. STM and its members have heavily invested in Crossref, Scholix, ORCID, the Research Organization Registry (ROR), and other initiatives and believe NASA's participation in and encouragement of the same will greatly improve the visibility of research and reduce administrative burdens.

¹ E.g. nearly 1 in 6 in the 2016 [Pay It Forward Report](#) and 1 in 5 in the 2019 [Taylor & Francis Researcher Survey](#)

Response to the question on implementation of SPD-41

STM's experience with the [2020 Research Data Year](#) (RDY) indicated that open data practices, as well as other Open Science practices, are a long-term enterprise that requires engagement of the whole community, an understanding of both structural and cultural barriers to adoption, and investment in infrastructure and training to address those barriers. Even with the 2020 successes of doubling both the percentage of articles with a data availability statement and the average percentage of journals that have data policies across publishers, much work still needed to be done. Therefore, we have transitioned these efforts into an ongoing Research Data Initiative. STM and its members would welcome the opportunity to work with NASA on an ongoing basis to apply the lessons learned to the Transform to Open Science (TOPS) initiative and 2023 Year of Open Science (YOOS) to spark change.

To be as successful as possible, both TOPS and the YOOS should be aligned with evidence-led, community driven approaches to Open Science. For example, STM's RDY engaged with a variety of outputs and collaborations, including:

- The Research Data Alliance Data Policy Standardisation and Implementation Interest Group [Journal Data Policy Framework](#)
- The Center for Open Science [Transparency and Openness Promotion \(TOP\) Guidelines](#)
- The FAIRsharing.org co-curated [database of standards, policies and databases](#)
- The FORCE11.org/NIH BioCADDIE [Data Citation Roadmap for Scientific Publishers](#)

These and other Open Science community initiatives could be used to support NASA's goals and ensure alignment with developing practices, reducing burdens and increasing uptake.

A key requirement for promoting access is adequate funding to support the development of tools and outlets for the sharing of research data, the communication of research methods, and other outputs related to research, including publications. Many studies have demonstrated the significant costs involved in enabling Open Science – costs that could be far in excess of current levels. For example, the [2016 Pay It Forward Report](#) showed that, to transition to Open Access for publications, resources beyond those currently allocated to universities would be necessary. The costs of supporting open scholarship when it comes to data, code, and other practices are likely even larger. Alongside funding for infrastructure and publication of articles and data, investments will be needed in training and support for the skills needed to tag, curate, and share these outputs.

At the same time, funding alone is not enough. In order to promote open scholarship, it will be crucial to provide the required support and training for researchers alongside incentives and also encouragement to allocate funding to these efforts. Topics for such education include

methodological training in tagging, curation, and sharing; guidelines for responsible research and data integrity; and the identification of best practices and appropriate venues for research outputs. In coordination with other stakeholders, NASA has the opportunity to drive cultural change through signposting, standard-setting, and explicit support.

We are pleased that NASA explicitly articulates the need for collaboration in “*Goal 3: Harness the Community and Strategic Partnerships for Innovation*” of SMD’s Strategy for Data Management and Computing for Groundbreaking Science, as well as the inclusion of a goal to “foster and encourage contributions and engagement with communities and organization setting standards and best practices” in the SPD-41 draft (III. General Policies, Section O). We believe that NASA can most effectively implement Open Science practices and address the issues raised above by working in partnership with the private sector and other stakeholders to leverage existing efforts and support emerging innovative technologies and services. However, additional steps need to be taken to operationalize this goal. We encourage NASA to establish a formal mechanism for working with publishers and other stakeholders to address the implementation of the policy, the broader transition to Open Science, and any problems that arise along the way. Potential opportunities for such collaborations could include mechanisms for encouraging data sharing, synergies between open data and Open Access publication practices, sustainable and holistic funding practices for open science, testbeds for early sharing and curation, or appropriate structures to support machine learning and artificial intelligence.

To be successful, NASA should also reduce complexity and streamline practices, by aligning policies in collaboration with key stakeholders including other Federal agencies and diverse research sectors. For example, federal agencies are already active in the Research Data Alliance and should seek opportunities to collaborate and engage in industry and non-profit initiatives, including Scholix for linking research objects, the FAIR Data initiative, the STM 2020 Year of Research Data, COPDESS, and other similar initiatives.

Summary

We appreciate the opportunity to engage through this RFI and would welcome additional opportunities to collaborate. STM and its members have been working for more than a decade to promote Open Science practices and increase options for Open Access publishing and the sharing of research outputs. We invite NASA to review some of these efforts on our [STM and Open Science webpage](#). We would welcome additional opportunities to discuss and collaborate with NASA on the implementation of SPD-41, TOPS, and the YOOS to make a vision of a high-quality, sustainable, and more open scholarly communication environment a reality.