

28 April 2020



Lisa Nichols, Assistant Director for Academic Engagement  
Office of Science Technology Policy  
Eisenhower Executive Office Building  
Washington, DC 20504

Dear Dr. Nichols,

On behalf of the American Geophysical Union (AGU), a nonprofit, nonpartisan scientific association representing more than 110,000 Earth and space scientists worldwide, we appreciate the opportunity to submit our responses to the OSTP on public access to peer-reviewed scholarly publications, data, and code resulting from federally funded research.

Before responding in detail, we would like to provide some overall perspectives. First, AGU's mission<sup>1</sup> is "to support and inspire a global community of individuals and organizations interested in advancing discovery in Earth and space sciences and its benefit for humanity and the environment." Efforts around open science, open data, ethics, quality and integrity, transparency, and diversity, as well as communicating, interpreting, and sharing research to the public all mutually support this mission. We thus view open science as broader than free access to peer-reviewed research and data and code. It also includes expanding access to participate in scientific meetings and sharing this content; expanding diversity and inclusion in science globally, and promoting equitable participation in scientific activities such as peer review, honors, editorial positions and more; and sharing, communicating, and engaging the public in science and science-related activities equitably. These pursuits all contribute to a robust scholarly infrastructure and public access and trust in science.

Secondly, reinforcing and ensuring quality and integrity in peer-reviewed publications and research data are important not just for robust science but also for the diverse critical public uses of this output.<sup>2</sup> This includes that the use of "peer-reviewed" publications is codified in U.S. legal, regulatory, and advisory systems, and in comparable international uses.<sup>3</sup>

This broader picture frames our specific comments, which highlight that 1) there are opportunities, particularly with data and code, for impactful leadership by the U.S.; 2)

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<sup>1</sup> [https://news.agu.org/files/2020/04/Final\\_AGU\\_Strategic\\_Plan\\_2020\\_Final.pdf](https://news.agu.org/files/2020/04/Final_AGU_Strategic_Plan_2020_Final.pdf)

<sup>2</sup> Hanson, B., *et al.* (2017), Earth and space science for the benefit of humanity, *Eos*, 98, <https://doi.org/10.1029/2018EO071991>.

<sup>3</sup> Hanson, R. B., "The new landscape of ethics and integrity in scholarly publishing," in Gunderson, L., Editor, *Scientific Ethics* (AGU/Wiley, Washington, DC, 2017).  
<https://doi.org/10.1002/9781119067825.ch8>

complicated balances maintain transparency, access, quality, reliability, broad communication, and integrity in science outputs while supporting robust public uses, decision making, and other uses. Sometimes seemingly positive steps can have unintended consequences affecting broad participation, quality, or other goals. One example is the growth of “predatory” open-access journals and the harm they have done.

### **Expanding Access to Peer-Reviewed Scholarly Publications**

AGU is committed to open science and strives to provide the widest possible dissemination for scientific journal and book content to encourage global, inclusive participation. All new journals that AGU acquired or started since 2010 have been gold open access titles. AGU flipped *Space Weather*<sup>4</sup> to gold open access starting in 2020, and all other subscription journals allow an open access option. In 2014, AGU began to provide free access to all content 24 months after publication going back to 1997. Since 2019, AGU has provided free access to members to all older journal content (the AGU Digital Library, 1895-1996)<sup>5</sup>. Articles are also free to journalists as part of AGU’s outreach to the press and free to readers when major media links to the articles (a service provided by our publisher, Wiley). AGU also participates in Research4Life,<sup>6</sup> which offers free or low-cost access to publications for audiences in developing countries.

AGU has also developed liberal green open-access policies and options for authors. AGU allows authors to deposit their final published paper in an institutional repository or personal website after 6 months, and AGU participates in CHORUS<sup>7</sup> to provide access to federally funded research. AGU (along with Wiley and Atypon) helped launch a preprint server, the Earth and Space Science Open Archive (ESSOAr)<sup>8</sup> and encourages authors to deposit manuscripts there. This allows all authors, not just those with funding, the ability to share their work freely early in the process, including at submission or acceptance. ESSOAr also allows authors to share posters presented at meetings. As you know, preprints are being used to share early research related to COVID-19. Through these mechanisms, 96% of all content published in AGU journals since 1997 is freely available.

In conjunction with Wiley, AGU publications also are included in several “publish and read” deals across Europe, as well as with a few universities and consortia in the U.S. These transformative deals provide a mechanism for institutions to pay author open access fees as a bridge to move away from journal subscriptions. Through our gold and green open access options, as well as by our participation in transformative deals, AGU is compliant with Plan S.

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<sup>4</sup> <https://fromtheprow.agu.org/agus-journal-space-weather-to-become-open-access/>

<sup>5</sup> <https://fromtheprow.agu.org/agu-digital-library-2020-added-membership-benefit/>

<sup>6</sup> <https://www.research4life.org/>

<sup>7</sup> <https://www.chorusaccess.org/>

<sup>8</sup> <https://essoar.org>

At the same time, AGU journals and AGU have expanded coverage and translation of our science to other scientists, the public, and policy makers. We are now publishing more than 100 commentaries<sup>9</sup> per year, all of which are freely available immediately. As part of our Centennial in 2019, AGU researchers published dozens of papers overviewing “Grand Challenges” in our sciences, all open access. AGU also publishes *Eos.org*, which summarizes AGU and other journal content, completely free to everyone.

To increase quality, AGU journals have expanded editorial teams and enhanced requirements and quality assurance around open data and code (see below). We have used our publications and related data to explore issues around and address diversity, inclusivity, and implicit bias in our science.<sup>10</sup>

In sum, AGU has invested heavily and operated to expand access greatly to not only the peer-reviewed science but also a wider variety of enriched material aimed at broader audiences that help provide meaningful access to research, all while improving the quality of the content.

There are thus multiple options for researchers and readers in the current system. Certainly, some of these options have not yet been widely adopted by other or all stakeholders, such as preprints, but the landscape isn't limiting. The broad society efforts to enhance quality are so far supported by current business models for scholarly publication. Further incentivizing use of these options, including rewarding quality and expanding broader communication resources, would be welcome and would indicate to societies that their investments are valued.

Many researchers in the Earth and space sciences do not have funding to publish all their research in gold open access titles. In our recent survey of authors, 28% said they did not have funding for any open access fees, let alone for publishing all their papers in this way, and a recent survey by Springer shows that globally, open access funds are cobbled together.<sup>11</sup> About 15% of recent AGU journal articles and 30% of Earth science articles in the Web of Science do not list any grant support. Many of these authors are in the U.S. and other developed nations. AGU's hybrid portfolio ensures that researchers from around the world can participate in our journals. Submissions have continued to increase across AGU titles, indicating the value of this model and our journal reputation in the community, and the

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<sup>9</sup> <https://agupubs.onlinelibrary.wiley.com/topic/vi-categories-19449208/c298d643-1afd-421f-b0c8-6ae8645c1f28/19449208>

<sup>10</sup> See Lerback and Hanson, 2017; <https://www.nature.com/news/journals-invite-too-few-women-to-referee-1.21337>

<sup>11</sup> <https://www.springernature.com/gp/researchers/the-source/blog/blogposts-open-research/apcs-in-the-wild-whitepaper/17838036>

value of additional content AGU provides. This range of options, combined with the other initiatives described above, maximizes availability for all and enhances U.S. scientific leadership.

At the same time, publishers, including AGU, have worked to develop and expand gold open access journals with regard to the 12-month publication embargo in the U.S. We hope OSTP gives careful thought to the effect that changing or eliminating the embargo would have on support for gold open access journals and subscription titles (the hybrid model). We also hope that there is an understanding of the impact that new mandates may have on the investments that AGU and other societies are making to ensure quality and expanded access and communication through preprints and other research outputs. We would welcome a deeper engagement and discussion between OSTP and societies on how to optimize access, quality, integrity, participation, and communication across the sciences.

Finally, AGU and other society publishers, as well as authors, are trying to navigate diverse requirements across funders and researchers globally. More than half of the published papers in AGU journals now are by international author teams funded from multiple sources. Streamlining and aligning policies regarding green access, institutional repositories, use of preprints, and open access requirements would be both beneficial but also cost-effective. Having different, redundant, changing, or conflicting requirements for each author on a diverse team adds greatly to confusion and inefficiency. In turn, changing policies can complicate business decisions (for example, intentions to flip journals to gold open access).

### **Expanding Access to Data and Code**

AGU has long recognized the critical value of well curated and shared data. AGU was one of the first societies, in 1997, to adopt a position statement on data, noting that “Earth and space science data are a world heritage.” AGU’s data position statement<sup>12</sup> was updated in 2019, and affirms that: “All players in the science ecosystem—researchers, repositories, publishers, funders, institutions, etc.—should work to ensure that relevant scientific evidence is processed, shared, and used ethically, and is available, preserved, documented, and fairly credited.”

For data and code, while there are available or emerging international standards and leading practices for funders, researchers, repositories, and journals, and general support for these among stakeholders, in practice these are haphazardly followed and implemented for a variety of reasons. As emphasized recently by the National Academy of Science,

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<sup>12</sup> [https://www.agu.org/Share-and-Advocate/Share/Polymakers/Position-Statements/Position\\_Data](https://www.agu.org/Share-and-Advocate/Share/Polymakers/Position-Statements/Position_Data)

Engineering, and Medicine,<sup>13</sup> “All organizations within the scientific ecosystem need to promote that preserving data and code are essential to ensure the integrity and transparency of scientific research.” This is an area where strong support and coordinated leadership from the U.S. government and agencies would have a huge impact.

AGU provided suggestions for expanding data and code access in our response to the recent OSTP RFC on desirable repository characteristics.<sup>14</sup> In the Earth and space sciences, thanks to two efforts led by AGU and our partners, through the Coalition on Publishing Data in the Earth and space sciences (COPDESS), and the Enabling FAIR Data Project,<sup>15</sup> many publishers, repositories, and other key stakeholders are aligned in and committed to<sup>16</sup> supporting open and shared data and code. Major challenges remain but adoption can be greatly accelerated by federal guidance and support.

One of those major challenges is cultural adoption across science. Guidance that encouraged standard or common FAIR data and code management plans early in research projects, helped coordination across institutions including internationally, and indicated financial support for curation (see below) would be impactful. This would complement and support initiatives that societies, repositories, and publishers are already engaged in.

Another challenge is the need for adequate funding to ensure the value of data. Across science, there is a robust community of domain repositories that specialize in ensuring that data for specific disciplines is well-documented and integrated with a larger body of similar types of data for discoverability and ease of use. Many of these repositories do not have adequate funding to support all the data that should be sent to them. In addition, funding is typically for 2-3 years, which limits their ability to improve or maintain infrastructure. Some domains lack a repository, causing data to be placed in general repositories that may not support the value-added services needed for understanding and reuse. Finally, many repositories restrict the sources of data to, for example, projects supported by certain funders. Overall, the landscape is confusing and complicated for researchers trying to find the best repository and more so when working on international and multi-institutional teams with diverse funding.

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<sup>13</sup> National Academies of Sciences, Engineering, and Medicine. 2018. *Open Science by Design: Realizing a Vision for 21st Century Research*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25116>.

<sup>14</sup> AGU Response to OSTP RFC - Desirable Repository Characteristics <http://doi.org/10.5281/zenodo.3768718>

<sup>15</sup> <https://copdess.org/enabling-fair-data-project/>; see Stall, S, et al. (2019), Make scientific data FAIR, *Nature* 570, 27-29 (2019) doi: [10.1038/d41586-019-01720-7](https://doi.org/10.1038/d41586-019-01720-7)

<sup>16</sup> <https://copdess.org/enabling-fair-data-project/commitment-statement-in-the-earth-space-and-environmental-sciences/>

Wide, rapid, and standard availability of these data and other research outputs provide enormous societal benefits, including to our economy and health. These benefits depend on access to data collected worldwide, as we have seen with the COVID-19 pandemic. American competitiveness will be accelerated and protected by ensuring leadership and global standards and practices across stakeholders.

It will also be important that the U.S. consider the current and developing efforts related to this RFI occurring in the European Union, United Kingdom, Australia, and elsewhere to ensure that goals and expectations are complementary. By taking the lead in this way, the U.S. can help work through challenges around data sharing in countries that are not as collaborative.

### **Summary**

AGU supports expanding access to the scholarly outputs that will secure and support the research enterprise broadly and at the same time ensuring that these outputs are of high quality. We encourage an open process toward these goals that engages societies and our members who have deep experience in scholarly communication and outreach. We value the federal government as a partner and would welcome further dialogue and input.

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