August 17, 2023

VIA Email: *hq-publicaccess@mail.nasa.gov*
Louis Barbier
National Aeronautics and Space Administration
300 E St SW, Washington, DC 20546

ATT: APLU's Response to the *NASA's Public Access Plan*

Dear Dr. Louis Barbier,

The Association of Public and Land-grant Universities (APLU) appreciates the opportunity to provide comments to inform NASA's *Public Access Plan*. NASA has championed the importance of public access to publications and research data as evidenced by its Transition to Open Science (TOPS), and the creation of publication repositories, including NASA Scientific, Technical and Research Information discoVEry System (STRIVES), Astrophysics Data System (ADS), and NASA's PubSpace. APLU commends these contributions to advancing the scientific enterprise.

While there are a number of positive contributiosn of the Plan that will advance public access to research data and publications, APLU is deeply concerned by the requirement to share software that would create intellectual property, copyright, and cost challenges for researchers and institutions that have not yet been significantly explored by the community. We urge NASA to carefully review the comments and improve the Plan. Please know APLU is eager to be a resource as the process moves forward.

As you may know, APLU is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities. With a membership of more than 250 public research universities, land-grant institutions, state university systems, and affiliated organizations, APLU's agenda is built on the three pillars of increasing degree completion and academic success, advancing scientific research, and expanding engagement. Annually, our U.S. member campuses enroll 4.2 million undergraduates and 1.2 million graduate students, award 1.2 million degrees, employ 1.1 million faculty and staff, and conduct $48.7 billion in university-based research.

Public access to federally funded research is crucial for rigorous science, discovery, and reproducibility, and public universities are committed to sharing the results of their research whenever possible. To aid our member institutions in developing responses to public access policies, APLU and the Association of American Universities (AAU), with funding from the National Science Foundation (NSF#1837847 and #1939279) and the National Institutes of Health, hosted workshops with researchers, senior research officers, librarians, chief information officers, and organizations supporting increasing public access to research. The community discussions informed our responses to the questions posed by NASA below.

How to best ensure equity in publication opportunities for NASA-supported investigators?
APLU strongly supports NASA's harmonized definition of scientific data as underlying peer-reviewed publications
APLU strongly supports NASA's definition of scientific data as "scientific data underlying peer-reviewed scholarly publications," which is the definition of scientific data provided in the OSTP 2022 memo. This clarification as data that underlies peer-reviewed publications helps ensure implementation of the NASA *Plan*. It creates clarity for researchers and institutions in determining when and what data must be shared.

Appreciate NASA's flexibility in where and how to publish

APLU appreciates that NASA's *Plan* allows for flexibility in where researchers publish, allows for the submission of the peer-reviewed and accepted manuscript (commonly referred to as green open access), and allows for researchers to charge reasonable costs for publications to their awards. However, in journals with the broadest reach and impact, investigators might be barred by the publisher from sharing the accepted version (green access) with a 0-day embargo, and the investigators and their institution may not have the funds to cover article processing charges in these impactful journals, which may perpetuate inequities in the system. It will be important for NASA to consider how to address these equity issues.

Support NASA's commitment to provide guidance on Data Management Plans (DMPs)

NASA's DMP will require very specific information that may be challenging for early career researchers and emerging research institutions to navigate. We appreciate NASA's plan to require program managers to include data requirements and expectations and example DMPs in research announcements.

Recommend investment in research data repositories and curation services

As part of an overall strategy to address equity concerns, NASA should expand its currently supported publication repositories to allow for the deposit of research data, especially for data without a current disciplinary repository. Such a repository or repositories would ensure that research data adheres to the FAIR principles of findability, accessibility, interoperability, and reusability of data. NASA could support repositories and the expert staff who could provide curatorial support to ensure quality data curation, reducing the burden on any single researcher or institution and which would address many of the equity concerns related to publishing research data.

Recommend clarifying mechanisms to comply after the award period

Another concern of investigators is that the publication of research may happen after the end of an award due to the delayed peer review and revision process. Insufficient funds could hinder researchers from disseminating results in their preferred journals or repositories, impacting visibility and potentially marginalizing those from emerging research institutions. To ensure equitable dissemination, we urge NASA to explore options to 1) permit pre-payment of publication expenses, 2) allow institutions to retain allocated publication funds post-award, or 3) provide supplementary funding for publication costs.

Recommend investing in training and guidance for copyright considerations

The NASA *Public Access Plan* requires that copyright be obtained from any third-party works in their research articles before it is deposited in NASA's repository. Publishers typically provide guidance to authors about what and how to obtain copyright permission for third-party works in their research articles, a valuable service by the publishers. Their guidance may not cover the more permissive copyright permissions needed by NASA's repositories. Similarly, for software, there may be licensed code within a larger lab-developed piece of software, and without that licensed code, the software will not work. These snippets or modules of code may only be licensed for use by that lab. NASA should anticipate and have expertise on hand to advise researchers about the appropriate permissions to obtain for any third-party works in research articles and/or software that are required to be shared. NASA should also provide guidance on what researchers should do if they are unable to gain permission from the third-party copyright holders for NASA's potentially more permissive license. For publications, does the lead author redact that portion of their paper and direct the end user to the version of record with the commercial publisher (which may not be open access)? For software, it may become even more burdensome to detangle and share parts of the code that might be differentially licensed. Researchers may need additional guidance on what must be shared in these particular and very contextually dependent cases. NASA should be prepared to help advise researchers.

NASA seeks suggestions on sharing and archiving software.

NASA's *Public Access Plan* goes beyond what is required by the OSTP 2022 memorandum and calls for public access to software. It requires that "scientific software underlying peer-reviewed scholarly

publications resulting from federally-funded research must be made freely available and publicly accessible by default at the time of publication". This is not a requirement in the NIH, NSF, NIST, or DOE plans, and for that reason, we address our significant concerns here.

Burdensome expansion to require software sharing
First and foremost, this expansion of the NASA policy will impose additional and currently unknown burdens on researchers and institutions. Within some academic communities, there is already a culture of sharing software and code in open-source and open-access ways. While within other disciplines, this is not part of the culture, and they may lack disciplinary standards of what is software and how to share it. APLU would be happy to work with NASA to better understand the challenges and opportunities with sharing software and code and to help advance a culture of software sharing within and across disciplines.

Training for program managers and reviewers is needed on patentable software
We appreciate that NASA has outlined a process for requesting a waiver for the requirement to share software in its *Plan*. We also appreciate that software with intellectual property considerations can be released from this requirement. This is an important aspect of the *Plan* because a researcher may develop software that they intend to patent to generate revenue and/or assert their rights if there are infringements by third parties. Their ability to patent the software may be severely curtailed by the requirement to make it publicly accessible. We encourage NASA to provide training for its program managers and reviewers about the importance of considering this as valuable intellectual property when reviewing the Software Management Plan (SMP).

Additional guidance is needed on what is scientific software that must be shared
Software and code are not well-defined in the *Plan*. "Software" could include a wide range of code across a series of experiments, everything from an Excel formula used to organize a data set in increasing order, to proprietary software that runs a piece of lab equipment, to lab-developed software of 10,000s of lines of code that has licensed proprietary code embedded in it. The community will need more guidance about which and how this heterogenetic class of research product must be shared.

As mentioned above in the section on copyright, lab-developed software may include proprietary software packages in which the lab has purchased a license to use within that lab. The software will not be useful without this license, and it may be challenging to extract that code from the lab-developed software package. The provenance of each line of code becomes challenging, especially for code that may have been written decades ago and is still used in active lab operations and experiments. Researchers must be released from an obligation to share software that they do not own the rights to.

Recommend that the Plan clarify that software can be released "As Is"
Additionally, installation in a new computing environment may impact the functioning of software that was designed for a different environment. Stated another way, the software may not be platform-independent. It can take significant time to rewrite the code/software so that it runs in a different computing environment. Researchers should be allowed to release their software "As Is" and should be absolved of ensuring that their software runs on other platforms.

Recommend discussion with the community on infrastructure for containerizing software
Many of the challenges listed above about software could be partially addressed by having a software development environment that allows for containerizing software. We encourage NASA to consult stakeholders, and APLU is eager to be a resource.

NASA seeks steps for improving equity in access and accessibility of publications.
Invest in training and support on machine-readability and human accessibility of research products
NASA should provide guidance on how to make their publications and research data machine-readable and human-readable for those with accessibility issues. Is this a service that will be done by NASA's publication

and data repositories? Does NASA anticipate that certain standards will be shared with the community that ensures that products are human and machine-readable? If so, NASA should provide training to researchers on these standards and required practices. This will be most helpful for less-resourced institutions, less-resourced disciplines, and less-resourced labs.

NASA seeks information on effective approaches for monitoring trends in publication fees and equity in publication opportunities.
Recommend monitoring costs for article processing charges and other costs for public access
It was not clear in the *Plan* how NASA would be monitoring costs related to publication fees, data curation and deposition, and software sharing. We encourage NASA to monitor publication outcomes to assess whether less-resourced institutions, disciplines, and/or labs are increasingly locked out of publishing in the most accessed journals. Additionally, the academic community is concerned that publication costs will increase as publishers shift from collecting revenue from readers to collecting revenue from research awards. Investigators are concerned that their grant budgets will not be able to pay these increased costs. To help ensure adequate budgeting, we suggest that NASA analyze current article processing charges (APCs) across disciplines and set "reasonable publishing costs" based on current market standards for publications, data deposition, and software development. Conducting annual assessments could ensure up-to-date cost guidelines for investigators. Engaging in ongoing dialogues with researchers, institutions, repositories, and publishers, particularly from professional societies (who manage society journals), could further define these "reasonable publishing costs" for publications.

NASA seeks suggestions on any specific issues that should be considered to improve the use of PIDs
APLU, the Association of Research Libraries, the California Digital Library, and AAU released a **report** in 2019 with recommendations for data practices supporting an open research ecosystem (NSF #1945938). Through those discussions, we came to a consensus on five persistent identifiers (PIDs) that would help ensure that research data is FAIR. These were Digital object identifiers (DOIs) to identify research data, as well as publications and other outputs; Open Researcher and Contributor (ORCID) IDs to identify researchers; Research Organization Registry (ROR) IDs to identify research organization affiliations; Crossref Funder Registry IDs to identifier research funders; and Crossref Grant IDs to identify grants. Additionally, we recommended that NASA, in coordination and harmonization with other federal agencies, could fund the design and development of tools and services to support the use of PIDs and could design systems to assign PIDs automatically within their platforms. This will be especially necessary for less-resourced institutions that may not have a research librarian to provide these services.

Recommend updating the glossary
We note that APLU, AAU, ARL, and SHARE are listed in the Glossary, but they do not appear in the plan. We recommend updating the Glossary to remove these terms.

Sincerely,

Kacy Redd
Associate Vice President, Research and STEM Education Policy, Association of Public and Land-grant Universities