

**Testimony on *Public Access to Federally Funded Research to the Information Policy, Census, and National Archives*
Subcommittee of the Oversight and Government Reform
Committee**

Association of Public and Land-grant Universities, A·P·L·U,
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I thank the committee for the opportunity to speak with you today on *Public Access to Federally Funded Research*. This is an important topic for higher education and the future of this country and I am pleased to have this opportunity.

I am currently the Vice President of the Association of Public and Land-grant Universities. Prior to this position I spent 13 years as provost and executive vice chancellor of the University of Kansas. I am also an economist. My interest and long-time involvement in access to scholarly writing was at first intensified by my both my duties as provost and my discipline as an economist. Decisions about resources for the Kansas library were important as they had a direct effect on our ability to succeed as a teaching and research institution. When, over two decades, journal prices increased at a nearly 10% annual rate while our budget barely increased in real terms, we faced some hard decisions. That continuing very high inflation rate raised my interest as an economist. I began to study the economics of scholarly journals and, in 1998, I spoke to the Association of Research Libraries and outlined a possible remedy for the journal access problem: the National Electronic Article Repository (NEAR). NIH's PubMed Central has many of the characteristics that I outlined for NEAR. I have written and spoken frequently on scholarly communications in the U.S., Europe and Asia. My involvement in this issue continued into my current role as Vice President for APLU and is an issue important to the association.

On behalf of the Association of Public and Land-grant Universities (APLU), I speak in strong support of increasing public access to federally funded

research by providing public access to the results of research funded by the federal government that is subsequently published in scholarly journals. We support Federal legislation ensuring public access. Well-formed public access policy will increase the pace of scholarly inquiry and is needed. APLU's endorsement of public access is based on our polling of the Association's Board and of all the Provosts and Research Officers at our member universities. Our member universities have a special mission of outreach and engagement with their communities; ensuring that the research they produce is widely available to the public at no additional cost to them is a true expression of that mission.

Background of the Association

APLU is an association of public research universities, including the flagship and land-grant institutions in every state and many state public university systems. Our 219 members enroll more than 4.7 million students, award 60 percent of U.S. doctoral degrees and conduct nearly two thirds of all federally funded academic research, totaling more than \$18 billion annually. The 1890 historical black land-grant schools are our members as well as the 1994 tribal land-grant colleges. We are the face of this country's highly diverse public four-year higher education system, especially of those universities that have a research focus. And, while we do not have community colleges as members, their students frequently transfer to our member universities so we have a keen interest in factors like the availability of scholarship, which affect their quality.

Benefits to Research

Provision of public access to scholarly work arising from federally funded grants and published in scholarly journals will enable faculty and researchers to benefit from these findings and to build on them in their own research. While 131 of our member universities are classified by Carnegie as "high" or "very high" research universities, their libraries cannot afford to subscribe to all of the scientific literature. Their faculty from time to time experience delays in accessing articles published in scholarly journals or cannot gain access. These roadblocks negatively affect their research productivity. We think that the AAAS survey of difficulties encountered in accessing copyrighted literature is representative of the difficulties researchers at APLU institutions face (*Intellectual Property Experiences In the United States Scientific Community*, 2007, Stephen A. Hansen, et. al., on behalf of

the American Association for the Advancement of Science (http://sippi.aaas.org/Pubs/SIPPI_US_IP_Survey.pdf). The study surveyed 2,157 U.S. scientists. 562 of those scientists reported negative effects on their work because of difficulty in accessing the scientific literature. The table below reports the degree of effect on their work by category (op. cit, p. 112). The consequences ranged from brief delay to abandonment of the research project.

Q 35. Problems associate with accessing scientific literature had the following effect(s) on your work (check all that apply):

	Count	Percent
I have not had problems associated with accessing scientific literature	52	10%
There were no effects on my research	51	10%
They delayed my research less than one month	217	42%
They delayed my research for one month or more	108	21%
I had to change the research approach	67	13%
I had to abandon my research project	18	3%
There were other effects on my research. Please explain.	16	3%
Loss of research funds to pay for access or to duplicate work	24	5%
Less background research done	49	9%
Unspecified delay of work	12	2%
Total	614	119%

516 responses out of 534; item response rate+96%

We are confident that improved access to research findings will have positive effects on the research products of faculty at public research universities in the United States.

Additionally, our universities have global missions that would be aided by broadened access to research findings. Especially in low-income and developing countries where access is now difficult if not impossible, improved access could lead to substantial advances in scientific discovery. Many faculty in universities in these countries received their Ph.D.s from U.S. universities and would readily make use of improved access in both their research and their teaching. The latter is of great importance because many of their students will ultimately become graduate students in the U.S. It is in our interest for those students to arrive with undergraduate educations fully informed by the most recent scientific findings.

Preservation and the Need for Legislation

A well-formed public access policy will also ensure that the scholarly literature arising from federal grants is preserved. Scholarly journals are moving increasingly from print to electronic form. Many new journals are issued only in electronic form. Universities license access to electronic journals for a fixed period of time. Thus the ability of universities to preserve the literature by preserving printed volumes does not work in the digital world. Ultimately universities and scholars must rely on the publisher to preserve the literature. Some publishers are undercapitalized, some publishers have incentive to preserve the literature only so long as there is a market for selling it, and some publishers simply do not have the technical ability to ensure long-term preservation of electronic documents. Public access policies that mandate deposit in secure depositories which are adequately backed-up, spread about geographically, and kept up to date technologically provide the preservation that scholarship requires.

Voluntary deposit will not produce a complete set of this critical literature. NIH's experiment with voluntary deposit proved this point. Busy scientists for many reasons do not have voluntary activities as their highest goal. Failure to have a complete record of scholarly articles arising from federally funded research will lead to inefficient research efforts in the future; efforts that do not learn from past successes and failures. Only a federal mandate that the complete record of this work be preserved can ensure that it will be preserved.

Benefits to Education

Clearly, superior graduate education is based on use of scholarly literature. The highest quality graduate student research papers, theses and dissertations can be produced only by those with substantial access to the literature. Ensuring that all published research arising out of federally funded research is available to graduate students would improve their papers and permit them to build on past findings in their research. Since many doctoral students serve as research assistants while pursuing their degrees, improved access to research findings also has the potential of improving the research products of the faculty members for whom they work.

Undergraduate study at our universities differs from study at non-research universities. Our faculty members are well-versed in the research literature and use research findings in their classroom presentations. The best of our undergraduates incorporate undergraduate research experiences in their programs of study. Essentially all of our undergraduate students access the scholarly literature as they write papers for their courses. Improved access to research will benefit undergraduate education.

While it varies across member universities, 20% to 60% of admitted students take coursework at community colleges. Few community colleges can afford to subscribe to an extensive array of scholarly journals. Thus, during the community college portion of their education, students have far less access to the scholarly literature than after they transfer to research universities. Thus, papers that they write while at the community college cannot benefit from access to scholarly literature. Similarly, their faculty members cannot incorporate in their instruction the latest research discoveries. While improved public access would have significant positive impact on research university undergraduates, it arguably would have the greatest impact on community college students because it would dramatically improve access by their faculty to research findings.

Benefits to Business and Members of the Public

Having faculty research fully and freely accessible to all members of the public is of high importance to public institutions. As scholarly journals have migrated from print to electronic form, access to their contents has been restricted largely to those who are members of the university community for which the electronic journal is licensed. Universities that once could lend copies of journals to the general public or permit them to have photocopies through inter-library loan can no longer do so. Thus the continuing migration of the scholarly literature to electronic form reduces its availability to the public.

Some members of the public have substantial educational foundations and seek to remain abreast of research developments in specific fields. Some are writing books and articles or even pursuing research. Some have diseases or family members with diseases and wish to know the latest research findings.

Many businesses need access to scholarly literature. Clearly, high-tech start-ups are in this category, but so are existing businesses whose processes are dependent on technology. Better information access improves their chances of remaining competitive and profitable.

Citizen desire to access the scholarly literature has many motivations. Those faced with disease want to know first-hand the results of government research that may provide greater understanding of their conditions, and many informed laymen can bring referenced findings to the attention of their physicians. Members of the public who simply want to be well-informed also appreciate access to the scholarly literature. Intensely motivated individuals learn how to read this often esoteric literature and make use of the findings it reports. The same motivations that lead government agencies to commission a scholarly work motivate such members of the public to want to read the results. Individuals motivated to read this literature have difficulty understanding why they cannot gain ready access to research that has been funded with public dollars.

What form of Public Access does APLU Favor?

The NIH public access model has proven very popular with our member universities and we support the spread of the model created by NIH to other federal funding agencies. The Federal Research Public Access Act follows the NIH model and APLU has endorsed its passage with some modifications noted below.

Ease of Compliance: This model is designed in such a way that compliance is easy. We have received only positive feedback from our members about the deposit process during the two and half years the policy has been in place.

Because a federal government-wide public access policy would involve multiple research funding agencies, it could potentially involve multiple public access repositories. Major research universities will have faculty members who hold grants from all of these agencies and some will have grants from multiple agencies at the same time. We urge that the ease of compliance presented by the single NIH policy be maintained as the policy is applied to multiple agencies. We suggest that, to the extent practicable, uniform requirements and procedures regarding deposit of papers be established across all funding agencies covered. Uniformity of deposit

requirements will reduce the complexity and cost and, simultaneously, increase the rate of compliance.

Ease of Access: Access to those items placed in PubMed Central is also easy. The PubMed Central database is fully searchable and items in it are fully accessible by Google and other search engines. The same ease of access can be replicated in university digital repositories, those maintained by disciplines, or by other research agencies.

Period of Embargo: The flexible zero- to twelve-month embargo period, depending on the preference of the journal of publication, also is acceptable. While everyone would like to have immediate access to text, such complete open access may not be compatible with the economics of the dominant form of journal, the subscription-based journal. We know of no rigorous studies that delimit how long an embargo is needed to provide financial viability for subscription-financed journals. We are unaware of any journals whose financial viability has been significantly damaged by the NIH public access requirement. On this basis we favor at least initial implementation of public access more broadly with the zero- to twelve-month embargo period.

To What Federally Financed Research Should Public Access Requirements Apply?

In principle, open public access should be the practice for research arising out of all federally funded grants. In practice, however, we believe that all federally funded research except that funded by the National Endowment for the Humanities and the National Endowment for the Arts should be covered by the public access policy. These two agencies are small relative to other funders and cost of public access per covered manuscript is likely to be very large. Both of these endowments fund activities that are less likely to be published in scholarly journal article form than are works funded by other federal funding agencies. In addition, journals in the humanities and the arts are more likely to be negatively impacted by a twelve-month maximum embargo period than are journals in the social, biological, and natural sciences, because the material in them is little diminished in value as time passes.

In What Form Should the Material be Made Available?

The choice is between the final manuscript version of the article and the form in which it appears in the journal. We favor the latter, so long as full-text, word-by-word search-ability can be made available. The article form of the material permits easy citation directly from the public access database as the page numbers of publication are present. Should full-text search-ability be limited in the article form, we favor inclusion of the manuscript form (XML) in the public access repository. Our preference for full-text search capability is because very powerful search engines with access to all content produce search results of greatest use to scholars.

Some suggest that access to final grant reports would provide adequate access to research findings. We do not accept this contention. While some grant reports are accessible, most are exceedingly narrow as they focus only on reporting findings related to the research question for which the funding was received and the methodology utilized. Articles appearing in scholarly journals often provide context for the results reported and relate those results to the wider literature. Scholarly articles are also more easily located through a variety of finding aids. Researchers, students, citizens and business users are best-served if they have access to the scholarly journal literature.

Who Should Have Access to the Collections of the Public Access Repository?

In brief, everyone. Since the material included will have been published, there will be no need for bans on access for any reason. Full transparency is more easily guaranteed if there is full access to the repository.

“Everyone” includes all types of searchers. The numbers of articles on some topics number in the tens or hundreds of thousands and are simply too great for individuals to read them all. Intelligent crawlers must be permitted full access to the collections so that all the material can be assessed by artificial intelligence. In this way individual researchers can be pointed to articles that appear to be relevant to their interests.

What Form(s) Should a Repository (Repositories) of Public Access Works Take?

We are agnostic on the question of form. The NIH PubMed Central model has proven to be functional but it may or may not be superior to a distributed model in which the material is deposited in multiple locations but brought together virtually as though it were located in a single repository. Thus an article conceivably could be placed in a faculty member's own university repository and be automatically and seamlessly included virtually in the funding agency's public access repository. Clearly, wherever and however the material is stored, it must be regularly backed up by multiple repositories in diverse geographic locations and otherwise protected against loss of data.

In this regard please note that most research universities have made major investments in electronic digital repositories. They are used to make readily available to all research forms like theses and dissertations, working papers, etc. that previously were difficult to access. These repositories could readily be used by research agencies if they chose a distributed rather than centralized approach.

Ultimately, items in the repository should be operationally linked to the data on which an article is based, such that a researcher can easily access the data. In time all federal agencies will require that data generated from grants be accessible and the public access repository should be designed such that the data will be easily matched with articles that rely on it.

How Should Public Access be Evaluated?

Public access should be evaluated on the use made of the scholarly literature. Frequency of access to the scholarly literature will undoubtedly be far greater than is presently the case if public access is mandated. We can take on faith that greater access will produce more rapid advance of knowledge although we can never measure the subjunctive.

Is Public Access Compatible with the Journal-Based Peer Review System?

Journal publishers opposing public access often claim that it will take away the funding needed for them to continue to support the refereeing process. Clearly the refereeing process must be supported. We know of no rigorous evidence that even very brief embargo periods cause scientific journal

subscriptions to decline. High-quality research universities will continue to subscribe to top-quality refereed journals; their researchers simply cannot wait six months or a year to access the literature. The evidence is that that public access has little impact on subscription revenue and is thus fully consistent with ensuring that refereeing of the literature continues.

We support public access rather than open access because an explicit tradeoff between having access to all scholarly journal articles after no more than one year's delay is preferable to running even a small risk that immediate access would damage the refereeing process. In the long run, it will be incumbent on any journal insisting that access be delayed to produce evidence that the harm done to science by delayed access is less than the harm that would be done to science if immediate access were provided. More and more scholarly journals have changed their practices to permit immediate posting on publicly accessible Web sites in explicit recognition that such access benefits science and does not harm the economics of journals or the institution of refereeing.

Concluding Comments

Federal legislation is required to ensure that there is full and free public access to scholarly articles arising out of federally funded research and that these works are preserved and remain available to future generations. Such legislation will increase access to researchers, teachers, students, businesses and members of the public. We urge the passage of legislation meeting these needs.